

# **General Programme Regulations for the Joint Master Programme in Applied Geophysics of Delft University of Technology, the Swiss Federal Institute of Technology Zurich and RWTH Aachen University**

## **1. Subject and scope of the General Programme Regulations**

The General Programme Regulations set out the requirements according to which students of the Joint Master Programme in Applied Geophysics (Programme) may acquire their Master degrees in Applied Geophysics.

## **2. Programme partners**

The Programme is the shared responsibility of the Faculty of Civil Engineering and Geosciences at Delft University of Technology (TUD), the Department of Earth Sciences at the Swiss Federal Institute of Technology Zurich (ETH) and the Faculty of Georesources and Material Engineering at RWTH Aachen University (RWTH), hereafter referred to as the partner universities.

## **3. Overview of the Programme**

The students of the Programme study together at each university and move between universities as a group. The students start their 120 credit points<sup>1</sup> Programme at TUD in the fall. After their first semester they move to ETH where they spend the spring semester and finally they move on to RWTH for their third semester. Depending on their Master thesis project they will spend their last semester at one of the three partner universities or outside organisations such as industry, government agencies or other university laboratories. The Programme ends with a joint diploma ceremony at TUD where the students receive a degree certificate of each university, making it in fact a triple degree programme. All degree certificates make reference to the Programme.

## **4. Programme governance**

### **4.1. Executive Committee**

The Programme is managed by the Executive Committee which is formed by one senior academic from each of the partner universities. The members of the Executive Committee, who are nominated by their home universities, each have one vote. As a rule the position of Executive Committee Chairperson rotates on a two-yearly basis between partner universities. The Executive Committee meets at least on a yearly basis. Its duties are specified either explicitly or implicitly in these General Programme Regulations as well as the Agreement.

### **4.2. Administrative Committee**

The Administrative Committee supports the Executive Committee in addressing and resolving open administrative issues. It is formed by one senior administrator from each of the partner universities and meets at least on a yearly basis.

### **4.3. Joint Examination Board**

The Joint Examination Board is responsible for all decisions concerning credit examinations, which are not part of local rules and regulations. It is formed by one senior academic from each of the partner universities. The members of the Joint Examination Board, who are nominated by their home universities, each have one vote. As a rule the position of Joint Examination Board Chairperson rotates on a two-yearly basis between the partner universities. The duties of the Joint Examination Board are specified either explicitly or implicitly in these General Programme Regulations as well as the Agreement.

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<sup>1</sup> The Programme follows a credit system, which is aligned with the European Credit Transfer System (ECTS). Credit points describe the average time expenditure required to achieve a learning goal. The curriculum is designed such that students may obtain an average of 30 credit points per semester.

Local boards at each partner university are responsible for local credit examinations. Details are specified in the local rules and regulations of each partner university.

#### 4.4. Industrial Advisory Committee

An Industrial Advisory Committee may be established as a sounding board for the Programme. The Executive Committee nominates members from relevant industry groups for participation in the Industrial Advisory Committee. Industry involvement is also desirable for funding scholarships, input on curriculum, guest lecturing, providing internships and master theses.

#### 4.5. Teaching and student supervision

In all three universities professors, senior lecturers, postdoctoral and other research professionals are the primary lecturers and supervisors of the students. One academic tutor at each university shall be responsible for tutoring and mentoring the entire group of students while they are at the respective university. The local administrations shall offer advice for non-academic problems. During the first and second moving periods, the academic tutors and administrative personnel of the partner universities are jointly responsible for the entire group of students. TUD is responsible for the period before entrance to the Programme.

### 5. Admission

#### 5.1. Admission requirements

Admission to the Programme may be granted to

- a) applicants with a Bachelor degree in appropriate subject areas (e. g. earth sciences, environmental sciences, physics, engineering) issued by one of the partner universities;
- b) applicants with a Bachelor degree of at least 180 ECTS CPs or an equivalent university qualification in appropriate subject areas (e.g. earth sciences, environmental sciences, physics, engineering) which gives evidence of the required qualification for the Programme from other top universities worldwide.

In order to be sufficiently qualified for the Programme applicants must have a solid background in the fundamentals of mathematics and physics as well as basic knowledge of geology and geophysics.

#### 5.2. Admission and selection procedure

Candidates for the Programme apply through the TUD admission system. A pre-selection of applications is made by designated personnel of the TUD Admissions Office. Applications passing the pre-selection procedure are then evaluated by the Executive Committee. Admission is granted by the Dean of the Faculty of Civil Engineering and Geosciences of TUD to students who have been selected for the Programme by the Executive Board. Admission to the Programme may be conditional, such that some applicants may have to fulfil specific conditions (e.g. pass certain examinations at their home universities) before final admission. Students who accept their admission offer will automatically be admitted to and enrolled at all partner universities for the entire duration of the Programme.

#### 5.3. Language requirements

The language of tuition is English. All teaching, exercise and practical material will be provided in English. All students are required to provide a proof of English language proficiency. The detailed requirements are published by TUD at the beginning of each admission period. Only students with a Bachelor from either TUD, ETH or RWTH, nationals from the U.S., U.K., Ireland, Australia, New Zealand and Canada as well as students with a Bachelor degree from one of these countries are exempt from the proof of English language proficiency requirement. TUD specifies the requirements in consultation with the Executive and the Administrative Committees.

### 6. Curriculum

#### 6.1. Course programme

A list of recommended courses will be provided to the students at the beginning of each semester at TUD, ETH and RWTH.

At TUD, the list of recommended courses can be extended with any course of their Applied Earth Science programme.

At ETH, the list of recommended courses can be extended with any course of their Earth Science programme.

At RWTH, the provided list of courses includes possible elective and voluntary courses that can be followed.

For courses outside these lists, a permission from the Joint Examination Board is required.

## 6.2. Requirements

Each student must obtain a minimum of 120 credit points<sup>2</sup> within 4 years to be awarded their Master degrees. It is recommended that students acquire their 120 credit points from the list of recommended courses. However, each student must:

- a) obtain a minimum of 25 credit points from each partner universities courses;
- b) pass the obligatory course and 2 out of 3 core modules at TUD, 3 out of 3 core modules at ETH and 3 out of 6 core modules at RWTH;
- c) obtain 30 credit points for the Master thesis project including an obligatory colloquium at the end of the project.

Students need to have obtained at least 25 credit points from TUD after one academic year and 25 credit points from ETH before 1 October of the calendar year in which they study at ETH. Students who don't obtain the necessary credit points from TUD and/or ETH in time are expelled from the Programme. However, they have the possibility to choose another track within the Applied Earth Sciences Master programme at TUD or make a request to the TUD examination board of Civil Engineering and Geosciences and ask for a free study program. In both cases they will have to make a plan with one of the professors involved. Note that the academic year starts around 1 September such that starting a new study in October is not recommended.

## 7. Registering for courses

At the beginning of each academic year, the courses of the Programme, including details of compulsory credits, and type and weight of exam, will be provided by each partner university. Students register for their courses through the respective system of each partner university.

## 8. Credit examinations

Credit examinations are in the responsibility of each partner university and thus handled according to local rules and regulations. The course schedule of each partner university specifies the type and modalities of credit examination.

The results of the credit examinations are to be declared to the students, the respective administration units and in particular the coordinating office at TUD within a reasonable timeframe.

The Joint Examination Board may require students who have interrupted or delayed their studies to retake any credit examination they passed during their previous enrolment in the Programme if the content of the course in question has considerably changed since then. Such re-entries will be evaluated on a case by case basis.

## 9. Grading system

### 9.1. National grading scales and conversion to absolute A-F grades

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<sup>2</sup> The Programme follows a credit system which is aligned with the European Credit Transfer System (ECTS). Credit points describe the average time expenditure required to achieve a learning goal. The curriculum is designed such that students may obtain an average of 30 credit points per semester.

Each partner university uses its local grading scale. On the degree certificate the grades of all courses are converted to absolute A-F scale according to the following table:

A-F grading scale	Description	TU Delft	RWTH	ETH
A	Excellent	9.2 to 10	1.0 to < 1.5	> 5.5 to 6.0
B	Very good	8.4 to < 9.2	1.5 to < 2.1	> 5.0 to 5.5
C	Good	7.6 to < 8.4	2.1 to < 2.8	> 4.5 to 5.0
D	Satisfactory	6.8 to < 7.6	2.8 to < 3.5	> 4.0 to 4.5
E	Sufficient	6.0 to < 6.8	3.5 to 4.0	4.0
F or FX	Fail	< 6.0	> 4.0	< 4.0
X	Exemption			
> larger than, < less than				

ECTS and local grades will be listed on the diploma supplement.

### 9.2. Obtaining credit points

A student will receive the allocated number of credit points for each course provided he/she has obtained a minimum grade of E in the respective examination or has been granted an exemption.

### 9.3. Final average grade

TUD is responsible for providing the final average grade. For calculating this average, the marks of the courses from each university are converted to the TUD grading scale that has the finest scale and uses the scale 1 to 10, rounded off to one decimal. For these conversions, the following table is used:

<i>ETH mark</i>	<i>TUD-equivalent</i>		<i>RWTH-mark</i>	<i>TUD-equivalent</i>
6.00	10.0		1.00	10.0
5.75	9.5		1.30	9.6
5.50	9.0		1.70	9.1
5.25	8.5		2.00	8.7
5.00	8.0		2.30	8.3
4.75	7.5		2.70	7.7
4.50	7.0		3.00	7.3
4.25	6.5		3.30	6.9
4.00	6.0		3.70	6.4
			4.00	6.0

Then the weighted average, with the ECTS credits of the courses as weights, is determined. Finally, the TUD-scale average is converted to the average in the absolute A-F grading scale using the table under 9.1.

## 10. Master thesis

### 10.1. Choice of master thesis theme

The Joint Examination Board publishes a list and description of research themes for Master thesis projects. Representatives from each of the three partner universities and, if applicable, from industry give short presentations on the potential research projects and are available to discuss these with the students. Some research projects may involve extensive periods of closely supervised research in industry, government or other university laboratories.

Students may also propose research themes for their thesis projects. Such proposals must be submitted to and confirmed by the Joint Examination Board at least ten days before the presentation of research themes.

After the presentations, each student submits to the Joint Examination Board a ranked list of three research themes, each one supervised by a different partner university, that he/she may be interested in pursuing in his/her thesis project. Subject to availability and an equitable distribution of active thesis projects amongst the three partner universities, every reasonable effort is made to provide the student with a research theme that matches his/her preferences and suites his/her knowledge, skills and experience. The principal supervisor of each project makes the final decision as to which student, if any, is sufficiently or best qualified and motivated to undertake the project.

A change of the Master thesis project will be possible once, but only for cogent grounds and only within the first month of the start of the master thesis project.

Each student is assigned a principal supervisor who assumes the role of primary advisor to the student for the duration of the Master thesis project.

The final list of approved Master thesis projects is forwarded to the administrations of the three partner universities.

The schedule of this procedure is announced one month before the students submit their ranked list of research themes or their own proposed research. This schedule will be announced via email and put on the website.

#### 10.2. Master thesis projects outside of the partner universities

A Master thesis project conducted outside of the partner universities requires the explicit approval of the Joint Examination Board. Acceptable outside organisations include companies, government agencies and other university groups, all of which work in various fields of Applied Geophysics.

In addition to a principal supervisor from one of the partner universities, a supervisor from the outside organization will be assigned to advise the student. The principal supervisor is expected to monitor the progress of the student at least once every two weeks.

#### 10.3. Beginning the Master thesis project

A student may only begin his/her Master thesis project once the research project has been approved by the Joint Examination Board and he/she can reach 83 ECTS by the end of the first exam period at RWTH.

Should there be cogent grounds for a student not obtaining the required 83 ECTS, the Joint Examination Board may allow the Master thesis project to begin.

#### 10.4. Duration of the Master thesis projects

The duration of the Master thesis project is 20 weeks (30 credits). This includes a presentation and a defence at the end of the project. The Joint Examination Board may extend the duration of the Master thesis project, if cogent grounds are provided by the thesis supervisor.

#### 10.5. Supervision and form of the Master thesis projects

The student must report to his/her supervisor(s) at least once every two weeks during the course of the Master thesis project.

At the 6- and 12-week marks, the student presents verbal reports on the status of the research. At the 15-week mark, the students and supervisors decide on the content and form of the written Master thesis. If there are sufficient original results, then an article may be prepared for publication in a scientific journal. Such an article, appropriately bound in the form of a thesis, is acceptable as the Master thesis. The maximum page number of the thesis is 70 excluding (digital) appendices.

The resulting Master thesis should be subjected to one round of corrections by the principal supervisor or his delegate before being formally submitted and examined.

#### 10.6. Completion of the Master thesis project, public presentation and defence

After the completion of the Master thesis projects the students have to present their results in a 15 to 30 minute public presentation. After the presentation an ad hoc thesis committee (see below) will examine the candidate on the thesis work in a closed sitting (defence) of at least 15 minutes. The completed Master thesis must be made available to the ad hoc thesis committee at the date specified in the academic calendar.

#### 10.7. Grading the Master thesis

Each Master thesis is assessed by an ad hoc thesis committee which normally consists of two examiners, one of whom is the principal supervisor and one from a partner university. The principal supervisor is responsible for forming the ad hoc thesis committee. The ad hoc thesis committee might be extended to additional members (e.g. the external supervisors from external master thesis projects) without voting right.

The ad hoc committee assesses the thesis, the public presentation and the defence, and the final decision on the grade is made by the examiners with voting rights. The examiners have to be involved in assessing the thesis, the public presentation and the thesis defence.

The ad hoc thesis committee makes recommendations concerning the grades (in the local grading system) to be given to the thesis including colloquium. The final decision concerning the grades is the responsibility of the two committee members with voting right.

The principal supervisor shall declare the results to the student after the colloquium presentation and the thesis defence. He/she will also inform the respective administration units and in particular the coordinating office at TUD.

#### 10.8. Repetition of a failed Master Thesis

A failed Master thesis may be repeated once. A repetition of a failed Master thesis must be repeated at the same university but with a different topic. The repetition may be conducted with the same or a new supervisor. To repeat a failed Master thesis the student has to submit a proposal to the Joint Examination Board which then assigns a principal supervisor for the Master thesis project. The student must start the repeated Master thesis within three semesters after the failed first attempt. For the duration, supervision, form, completion, presentation and grading of the Master thesis the same rules apply as for the failed Master thesis (Art. 10.4 – 10.7). If the repetition of the Master thesis fails or if the time limit to start the repeated Master thesis is exceeded, the student is expelled from the Programme. However, the student has the possibility to choose another track within the Applied Earth Sciences Master programme at TUD.

### 11. Graduation

#### 11.1. Award of degree

A student is eligible for the award of his/her Master degrees once his/her grade list is complete and all the final grades are passes (A through E).

#### 11.2. Documents and title

As proof that candidates have successfully gained their Master degree, the students receive a diploma document from each university:

- a) one by TU Delft which gives a certificate giving the student the right to use the title of "Ingenieur (Ir)" in Dutch and awards the student the degree Master of Science (MSc) in English.
- b) one by ETH in German awarding the title "Master of Science in Applied Geophysics";
- c) one by RWTH in German awarding the title "Master of Science RWTH Aachen University".

If legal frameworks allow, the diploma documents make reference to the Programme and its partner universities. They will be accompanied by a joint diploma supplement issued by TUD which also includes the grades.

### 11.3. With honours

A student will be awarded a degree "with honours" provided the following conditions have been satisfied:

- a) The grade given for the Master thesis is an A;
- b) The weighted average grade gained in the course list as being statutory for the Master's degree is at least a B;
- c) The grades list contains no grades lower than a D;
- d) The study duration for the Programme is 2 years. Exceptions can be requested from the examination board of the JMAG program when study delay is due to extenuating circumstances unrelated to the student's study behaviour.
- e) Not more than 1 re-sit has been taken on all courses of the program

If the candidate has been awarded a Master degree "with honours", then the term "with honours" will be included on all three degree certificates.

### 11.4. Graduation ceremony

A joint graduation ceremony will be held annually at TUD.

### 11.5. Leaving without completion of the programme

Students who have successfully passed one or more credit examinations, but who leave the Programme without eligibility for a degree certificate, may receive a declaration of such from the Joint Examination Board provided that they submit such a request.

## 12. Appeals

Appeals with regard to the admission fall under the appeal regulations of TUD. All other appeals, including appeals regarding the master thesis project, fall under the appeal regulations of the institution where the incident occurred.

## 13. Final provisions

### 13.1. Coming into effect

The General Programme Regulations come into effect at the beginning of the autumn semester 2020. They apply to students who enter the degree programme from that date onwards.