

NVAO  THE NETHERLANDS

## **INITIAL ACCREDITATION**

JOINT MASTER'S PROGRAMME IN  
APPLIED GEOPHYSICS

Technische Universiteit Delft (The Netherlands), Eidgenössische Technische Hochschule Zürich (Switzerland), Rheinisch Westfälische Technische Hochschule Aachen (Germany)

PANEL REPORT CONDITIONS

12 MAY 2023

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# 1 Description of the programme

## 1.1 General data

Institutions	: Technische Universiteit Delft (The Netherlands) Eidgenössische Technische Hochschule Zürich (Switzerland) Rheinisch Westfälische Technische Hochschule Aachen (Germany)
Programme	: Applied Geophysics
Level	: Master
Orientation	: Academic
Degree	: Joint Master of Science in Applied Geophysics
Locations	: Delft, Zürich, Aachen
Study load	: 120 ECTS credits <sup>1</sup>
Mode of study	: Fulltime
Field of study	: Technic

## 1.2 Profile of the consortium

The application was filed by a consortium of three public higher education institutions in three countries: Technische Universiteit Delft in The Netherlands, Eidgenössische Technische Hochschule Zürich in Switzerland and Rheinisch Westfälische Technische Hochschule Aachen in Germany. The consortium partners have cooperated in the IDEA League since 2006; the current cooperation agreement was signed in 2015. In October 2022 a renewed cooperation agreement was signed especially for this joint programme and will be valid as of September 2023.

The Technische Universiteit Delft (TUD) was founded in 1842 and is the oldest technical university in the Netherlands. Its eight faculties offer sixteen bachelor's programmes and more than thirty master's programmes in science, design and technology according to the common mission "impact for a better society". TUD successfully passed the institutional audit of the Accreditation Organisation of the Netherlands and Flanders (NVAO) and its programmes are recognised in accordance with the Dutch Higher Education and Research Act (WHW).

In 1855, the founders of modern-day Switzerland created the centre of innovation and knowledge that is now known as the Eidgenössische Technische Hochschule Zürich (ETH). Freedom and individual responsibility, entrepreneurial spirit and open-mindedness are its key values. ETH's programmes focus on the natural sciences, engineering and mathematics. The institution received institutional accreditation from the Swiss Accreditation Council in accordance with the Swiss Higher Education Act (HEdA).

The Rheinisch Westfälische Technische Hochschule Aachen (RWTH) is the largest technical university in Germany. It was established in 1870 and aims to become one of the leading and entrepreneurship-oriented universities of technology worldwide. RWTH's programmes are accredited by the German Accreditation Council in accordance with the German Interstate Study Accreditation Treaty.

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<sup>1</sup> Credits indicating the study workload, based on the European Credit Transfer and Accumulation System.

### 1.3 Profile of the programme

The joint master's programme in Applied Geophysics (JMAG) is a continuation of the master's programme Applied Geophysics as offered by the consortium since September 2006. The 120 ECTS credits programme aims to educate students in the geophysical methodologies needed to characterise the earth's subsurface and to monitor processes in the subsurface that are the consequence of human activity. It offers students the opportunity to study at three internationally renowned universities of technology, each with their own theoretical and practical expertise in geophysics.

Students spend one semester at each of the three partner institutions, starting in Delft and subsequently moving to Zürich and then Aachen. In the final semester, they work on a thesis research project offered by one of the partner institutions or a company. The curriculum comprises ten mandatory modules (total of minimally 57 ECTS credits), electives and the master thesis project (30 ECTS credits). The programme is taught in English and attracts students from a wide variety of countries.

Currently, graduates of the programme receive a triple degree and a single diploma supplement. RWTH and ETH award the degree of Master of Science in Applied Geophysics, while TUD awards the degree of Master of Sciences in Applied Earth Sciences with a track in Applied Geophysics. Recognition as a joint programme will make it possible to issue one joint diploma for the independent Master of Science in Applied Geophysics. In addition, graduates will still receive the Diploma Supplement that explains the contents of the programme. This joint degree is fully recognised by all three institutions and their respective countries.

### 1.4 Panel

Chair:

- Prof. Dr. Frank Witlox (chair), Head of Department and Senior Full Professor of Economic Geography at the Department of Geography of Ghent University (UGent, Belgium);

Members:

- Prof. Dr. Klaus Holliger, Professor of Applied and Environmental Geophysics at the University of Lausanne (Switzerland);
- Dr. Marion Jegen, Research Group Leader at Marine EM, Geomar/Helmholtz Centre for Ocean Research Kiel (Germany);
- Prof. Dr. Mark van der Meijde, Head of the Department of Applied Earth Sciences (AES), Faculty of Geo-Information Science and Earth Observation (ITC) and Professor in Geophysics at the University of Twente (the Netherlands);

Student member:

- Sena Çatal, student of Architecture and Urban Studies at TED University Ankara (Turkey) and ESU QA Student Experts Pool.

The panel was assisted by Tinka Thede MSc, policy advisor at NVAO, and Anne Martens MA, secretary.

All panel members and the secretary completed and signed a statement of independence and confidentiality.

## 2 Assessment realisation conditions

On 21 November 2022, the panel assessed the quality of the joint master's programme in Applied Geophysics during an online site visit. In its advisory report (2 February 2023), the panel issued a conditionally positive advice. Subsequently, the NVAO came to a conditionally positive decision in its decision of 6 March 2023 regarding the application for initial accreditation. Three conditions were imposed, which had to be met by 1 April 2023. The consortium started working on amendments directly after the site visit in November and submitted a supplementary dossier to the NVAO dated 31 March 2023, explaining how the consortium intends to meet the imposed conditions.

At the request of the NVAO, the panel assessed whether the consortium met the conditions. To this end, the panel studied the supplementary dossier. The panel based its decision on written input of the panel members as well as an online panel consultation on 21 April 2023.

The panel assessed the conditions for the joint master's programme in Applied Geophysics (JMAG) according to the standards of the European Approach for Quality Assurance of Joint Programmes in the EHEA. Only the criteria for the standards where conditions have been imposed are mentioned in this report. Per standard the panel presents a brief outline of its findings, as well as the considerations that led the panel to a concluding judgement on a three-point scale: the programme either meets, partially meets or does not meet the standard. At the end of this chapter and based on its judgements on the individual standards, the panel presents an overall conclusion on the quality of the entire programme. This conclusion can be either positive, conditionally positive or negative.

### 2.1 Condition 1 Standard 1: Eligibility

#### 2.1.1 Joint design and delivery

*The joint programme should be offered jointly, involving all cooperating institutions in the design and delivery of the programme.*

##### *Condition*

Create a clear plan to ensure more formal links between the three partner institutions that foster interaction between colleagues from the three locations, for all staff members at different organisational levels and at multiple moments throughout the year. Ensure that the teaching staff have continuous access to each other's materials.

##### *Outline of findings*

In the supplementary dossier, the consortium acknowledges that many meetings have been organised in an informal way in the past. The partner institutions have now agreed to organise four formal meetings per year in order to ensure more formal links between the consortium members. These meetings have a standardised agenda and the meetings' minutes will be shared and kept for at least six years. The Executive Committee – consisting of one senior academic from each partner university – attends all meetings.

The first of the four meetings takes place in August, just before the start of the new academic year and coinciding with the annual diploma ceremony. The Programme Coordinator, Joint Examination Board and the Executive Committee meet in Delft for a yearly evaluation. In addition, all teaching staff meet online to discuss the evaluations, planned improvements and

follow-ups. Support staff will also meet online to exchange information about the new cohort, evaluate the administrative cooperation and prepare the student transfer from Delft to Zürich at the end of the first semester.

The second meeting takes place in Aachen and coincides with the master thesis proposal presentation day in the first semester of the second year of the programme. The Executive Committee communicates the outcomes of evaluations, plans for improvements and follow-ups to students. Again, academic staff members of the three partner institutions meet online and support staff meet online or face-to-face to evaluate their cooperation.

Finally, at the end of each semester, all teaching staff of that semester will meet online to discuss the progress of the two running cohorts and discuss the improvements made in the programme. The Programme Coordinator and Executive Committee join these meetings.

Regarding the access to the material, the dossier describes that all course materials related to the core courses and electives will be made available through a shared folder on Surfdrive.

#### *Considerations*

According to the panel, the consortium has addressed the condition related to joint design and delivery in an adequate way. The formalised meetings are planned in a logical and detailed way, and involve relevant participants. The General Programme Regulations have been adapted to reflect the organisational changes. The panel considers the attendance of the Executive Committee at all meetings and the involvement of students in the second meeting strengths of the new set-up. The panel also appreciates that the meetings' minutes will be shared, so those who could not attend know what has been discussed and decided. The minutes will also show the development of the programme over the years. The panel recommends to include the names of the attendees in the minutes and to make attendance compulsory for key persons, with equal representation of all partner institutions.

The panel thinks that the shared folder on Surfdrive is in principle a fitting solution. This platform may also be a good place to store the minutes of the joint meetings. Nevertheless, the panel remarks that using an additional archiving system requires frequent maintenance and, as a consequence, the platform may not always contain the latest versions of materials. The panel therefore advises to plan a yearly update of the platform and to evaluate the use of the platform during the four annual meetings.

#### *Conclusion*

The panel assesses that the JMAG programme **meets** the condition related to standard 1.2, joint design and delivery.

## 2.2 Standard 5: Learning, Teaching and Assessment [ESG 1.3]

### 2.2.1 Assessment of Students

*The examination regulations and the assessment of the achieved learning outcomes should correspond with the intended learning outcomes. They should be applied consistently among partner institutions.*

#### *Condition*

Formalise the examination regulations for joint components of the programme, such as the thesis project. Decide how the theses will be assessed in a consistent way, by using local or a common set of regulations, and communicate this clearly to students at the beginning of the programme.

#### *Outline of findings*

The consortium has revised the General Programme Regulations and unified the assessment procedure of the thesis project. The changes have been formulated and agreed upon by the programme's Joint Examination Board. All students are assessed in the same way, regardless of their host institution during the thesis phase, by a thesis committee. This committee consists of at least two academic members, one of whom is the principal supervisor and one from a partner university. Each member must be a qualified assessor at their own university. The Joint Examination Board will inform all teaching staff involved as examiner about these changes. The Programme Coordinator will inform students during the programme's kick-off meeting and again at the master thesis proposal presentation day. Students are also informed about the rules and regulations via the programme's website.

#### *Considerations*

The panel is of the opinion that the programme has made significant efforts to address the panel's concerns about the equal assessment of the master thesis. The panel considers the solutions created logical and effective, and appreciates the use of one common set of regulations for the assessment of all theses. These regulations are well-articulated and shared with examiners and students.

Regarding the involvement of supervisors from the three partner institutions, the panel recommends that the local Examination Boards formally recognise examiners of the other partner universities as thesis assessors – provided they meet the local requirements, for instance having obtained a University Teaching Qualification (UTQ) or equivalent. This would facilitate the involvement of examiners from partner universities and may prevent potential discussions about the suitability of examiners as thesis assessors at institutional level.

The panel notes that the thesis project is the only truly joint component in the curriculum. Local rules and regulations still apply in all other courses and in case of issues with a specific institution. The panel deems it imperative that the consortium makes this distinction very clear to students at the start of the programme and in the General Programme Regulations.

#### *Conclusion*

The panel assesses that the JMAG programme **meets** the condition related to standard 5.2, assessment of students.

### 2.3 Standard 9: Quality Assurance [ESG 1.1 & part 1]

*The cooperating institutions should apply joint internal quality assurance processes in accordance with part one of the ESG.*

#### *Condition*

Set up formal quality assurance procedures for the joint components of the programme, such as the master thesis project, as well as mechanisms to inform each other about the outcomes of their own quality assurance procedures.

### *Outline of findings*

The dossier explains how the consortium has developed its quality assurance procedures for the master thesis. The Programme Coordinator will organise a yearly student survey to evaluate the master thesis project. This survey will be organised at a different partner institution every year, so all universities are regularly involved. The outcomes of the survey are shared with supervisors, the Joint Examination Board and the Executive Committee. Plans for improvement are designed during the annual meeting in Delft and shared with students during the annual meeting in Aachen. Subsequently, these plans are evaluated in Delft the next year to complete the quality assurance cycle. In addition, the Joint Examination Board will organise external peer review of a sample of thesis evaluations from all partner institutions.

The outcomes of local quality assurance procedures are shared during the annual meetings in August and at the end of each semester. These meetings involve the Programme Coordinator, Joint Examination Board and Executive Committee in Delft, and academic and support staff online. Students are informed about the outcomes of the quality assurance procedures via the IDEA League website and during the annual meeting in Aachen. In addition, the consortium has planned a midterm review, which involves all three partner institutions.

### *Considerations*

The panel concludes that the consortium has installed appropriate quality assurance mechanisms which form a comprehensive and coherent PDCA cycle. The communication and discussion of the results of local procedures is now clearly defined. The panel suggests that the programme visualises the proposed timing, objectives and participation in the meetings and procedures, for instance by means of a table, organigram or flowchart.

### *Conclusion*

The panel assesses that the JMAG programme **meets** the condition related to standard 9, quality assurance.

## 2.4 Conclusion

Overall, the panel finds that the supplementary dossier is complete and adequately addresses the realisation of the conditions. The panel was able to properly determine whether and, if so, how the consortium intends to meet the conditions.

The consortium has created a clear schedule with four annual meetings to ensure more formal links between the three partner institutions, involving academic and administrative staff members, the Joint Examination Board, the Executive Committee, Programme Coordinator and students. The panel recommends to include the names of the attendees in the meetings' minutes and to make attendance compulsory for key persons, with equal representation of all partner institutions. By means of a shared folder on Surfdrive, course materials will be made available to all teaching staff. The panel advises to plan a yearly update of the platform and to evaluate the use of the platform during the four annual meetings.

The programme has unified the examination regulations for the master thesis, so all students will be assessed in the same way regardless of their host institution. The panel recommends that the local Examination Boards formally recognise examiners of the other partner universities as thesis assessors to facilitate the thesis assessment procedures. Finally, the consortium has set up formal quality assurance procedures regarding the master thesis



project and mechanisms to inform partner institutions about the outcomes of local evaluations.

The panel concludes that the programme meets the imposed conditions. Therefore, the panel issues a positive advice.

### 3 Overview of the assessments

Standard	Judgement
<b>1. Eligibility</b>	
1.2 Joint design and delivery	Meets the standard
<b>5. Learning, Teaching and Assessment</b>	
5.2 Assessment of students	Meets the standard
<b>9. Quality Assurance</b>	
	Meets the standard
<b>Conclusion</b>	<b>Positive</b>

## Annex 3: Documents reviewed

### *Programme documents presented by the institution*

1. Response to conditional positive NVAO accreditation decision
2. Annex 1: 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

## Annex 4: List of abbreviations

AGP	Applied Geophysics
CEG	Faculty of Civil Engineering and Geosciences
ECTS	European Credit Transfer and Accumulation System
EHEA	European Higher Education Area
ESG	European Standards and Guidelines
ETH	Eidgenössische Technische Hochschule Zürich (Switzerland)
FQ-EHEA	Framework for Qualifications in the European Higher Education Area
JEB	Joint Examination Board
JMAG	Joint Master Applied Geophysics
NVAO	Accreditation Organisation of the Netherlands and Flanders ('Nederlands-Vlaamse Accreditatieorganisatie')
RWTH	Rheinisch Westfälische Technische Hochschule Aachen (Germany)
TUD	Technische Universiteit Delft (The Netherlands)
UTQ	University Teaching Qualification

This report was written at the request of NVAO and is the outcome of the peer review of the conditions for the new joint master's programme in Applied Geophysics of Technische Universiteit Delft (The Netherlands), Eidgenössische Technische Hochschule Zürich (Switzerland) and Rheinisch Westfälische Technische Hochschule Aachen (Germany)

Application number: AV-1840



Nederlands-Vlaamse Accreditatieorganisatie  
Accreditation Organisation of the Netherlands and Flanders

Parkstraat 83 • 2514 JG Den Haag  
P.O. Box 85498 • 2508 CD The Hague  
The Netherlands

T +31 (0)70 312 23 00  
E [info@nvao.net](mailto:info@nvao.net)  
[www.nvao.net](http://www.nvao.net)