

NVAO  THE NETHERLANDS

INITIAL ACCREDITATION

JOINT PROGRAMME
MASTER'S PROGRAMME IN
APPLIED GEOPHYSICS

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

PANEL REPORT
2 FEBRUARY 2023

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1 Executive summary

This report is issued by the panel appointed by the Accreditation Organisation of the Netherlands and Flanders (NVAO) and assesses the conditions for the initial accreditation of the proposed joint master's programme in Applied Geophysics (JMAG) as submitted by Technische Universiteit Delft (the Netherlands) on behalf of the consortium which also features Eidgenössische Technische Hochschule Zürich (Switzerland) and Rheinisch Westfälische Technische Hochschule Aachen (Germany).

The application concerns a joint English-language master's degree of 120 European Credits (ECTS credits), which is offered as a full-time two-year integrated multi-university programme in the Netherlands, Switzerland and Germany. Given these specific features, the panel based its assessment on the standards of the European Approach for Quality Assurance of Joint Programmes in the European Higher Education Area of October 2014, approved by the EHEA ministers in May 2015, which in turn are based on the European Standards and Guidelines for Quality Assurance.

The panel established that the joint master's programme is designed and delivered by a consortium of three well-renowned academic research institutions. The JMAG programme is a continuation of the triple degree master's programme Applied Geophysics as offered by the consortium since September 2006. Recognition as a joint programme will make it possible to issue one joint diploma for the independent Master of Science in Applied Geophysics. The contents of the programme remain unchanged.

The 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 one semester at three internationally renowned universities of technology, each with their own theoretical and practical expertise in geophysics. During the final semester, students work individually on a research project offered by one of the partner universities or a company, which eventually leads to a master thesis report.

The panel established that the programme's intended learning outcomes align with the master's level of the FQ-EHEA as well as relevant national qualifications frameworks. They cover a broad and comprehensive set of outcomes that are relevant to the discipline of applied geosciences and have been incorporated in a well-structured and coherent two-year curriculum of 120 ECTS credits. Students follow modules during the first three semesters and work on their thesis research project in the final semester. The programme has a set of mandatory modules but students also make a selection of electives and thus create their own study profile.

The panel is of the opinion that, overall, the examination regulations and assessment procedures are sufficiently clear and the assessment corresponds with the intended learning outcomes. The panel appreciates the variety of assessment methods and thinks that the exams show an appropriate level for a master's programme in applied geophysics. The consortium members apply their local regulations for parts of the programme that they provide. The panel considers this appropriate for the assessment of modules. However, the panel deems it necessary that the programme formalises the examination regulations for joint

components of the programme, such as the thesis project. The programme should decide how the theses will be assessed, by using local or a common set of regulations, and this must be communicated clearly to students at the beginning of the programme.

The panel established that, individually, the consortium members have appropriate quality assurance processes in place. The institutions employ a diverse set of evaluation techniques that regularly assess the quality of education and involve relevant stakeholders. Nevertheless, the panel strongly recommends that the partner institutions 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. They should discuss the outcomes in order to learn and further improve the programme. The panel stresses that all three institutions are equally responsible for the programme and therefore need to know and are accountable for what happens at the other universities. This also encourages the institutions to learn from each other. In addition, the communication of results towards stakeholders requires further attention.

The panel also states that the consortium members should cooperate more on other aspects. Many ties between the consortium members are informal and depend on individual connections between staff members. The panel therefore strongly recommends that the consortium creates more formal links between the three partner institutions to foster interaction between colleagues from the three locations – these should be organised for all staff members at different organisational levels and at multiple moments throughout the year. In addition, the panel deems it essential that the teaching staff have continuous access to each other's course materials.

The panel concludes that the JMAG has a sufficient and well-qualified body of academic staff members who develop and implement the programme. The staff members have relevant backgrounds that are related to the programme's curriculum as well as ample international experience. According to the panel, it would be beneficial if the staff members of the three institutions shared their experiences and expertise regarding didactics with each other. The panel therefore recommends that the programme investigates how the teachers from the three institutions may collaborate on this matter, inform each other about the requirements at the three institutions, discuss them and include peers in the assessment of colleagues.

The panel is of the opinion that the programme applies appropriate admission requirements and a transparent selection procedure. They support the formation of a balanced group of students coming from the EHEA and other parts of the world. All three partner institutions are involved in the selection procedure, while the programme can rely on the experience of TUD's International Office in handling student administration. The consortium has a well-structured plan for student support and offers relevant services to its students while they study at one of the partners as well as in the transition from one location to the next. The panel commends ETH and RWTH for the efforts made to arrange accommodation and recommends that TUD develops similar options for students who wish to spend their final semester in Delft. All partner universities have fitting procedures for welcoming students at their new host university. The panel appreciates that the students move from one institution to the next as one group, which likely contributes to them feeling 'at home' at the different locations.

The programme's self-evaluation report, additional documentation and discussions with representatives from all partner institutions have provided the panel with a comprehensive overview of the programme. Due to the wishes of the consortium, the site visit was organised online. Based on all collected information, the panel concludes that the programme partially meets standards 1.2 (joint design and delivery), 5.2 (assessment of students) and 9 (quality assurance) and meets all other standards. The panel's overall assessment of the programme's quality is conditionally positive and the panel advises NVAO to make a conditionally positive decision regarding the quality of the proposed joint master's programme in Applied Geophysics (JMAG) at Technische Universiteit Delft (the Netherlands), Eidgenössische Technische Hochschule Zürich (Switzerland) and Rheinisch Westfälische Technische Hochschule Aachen (Germany). The panel formulates the following conditions, which are to be met before 1 April 2023:

1. 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.
2. 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.
3. 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.

The Hague, 2 February 2023.

On behalf of the Initial Accreditation panel convened to assess the joint master's programme in Applied Geophysics,

Frank Witlox
Chair

Anne Martens
Secretary

2 Introduction

On 25 May 2022, NVAO received a request for an initial accreditation procedure regarding a proposed joint master's programme in Applied Geophysics (JMAG). Because this concerns a joint programme issued by three higher education institutions in the Netherlands, Switzerland and Germany, this request was submitted on behalf of the consortium by Technische Universiteit Delft.

Given the particular features of this application, NVAO convened an international panel of experts consisting of:

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

The composition of the panel reflects the expertise deemed necessary by NVAO for this accreditation exercise. The panel composition is also in line with the procedural requirements in the European Approach for Quality Assurance of Joint Programmes (C.2. Review Panel). On behalf of NVAO, Tinka Thede MSc was responsible for the coordination of the assessment process. The secretary, Anne Martens MA, drafted the panel report in close cooperation with all panel members and in agreement with the chair. All panel members and the secretary signed a statement of independence and confidentiality.

The panel based its assessment on the Standards for Quality Assurance of Joint Programmes in the European Higher Education Area (EHEA), issued in October 2014 and approved by the EHEA ministers in May 2015. This European Approach for Quality Assurance of Joint Programmes should be applied for quality assurance of international joint programmes if some of the cooperating higher education institutions require external quality assurance at programme level. The standards to be assessed are based on the European Standards and Guidelines for Quality Assurance in the EHEA (ESG). This procedure allows the possibility that only one procedure can lead to accreditation in several countries.

The panel members read the application documentation of the programme (Annex 3: Documents reviewed) and reported their preliminary findings before the site visit to the secretary. The secretary collected them and processed them for the preparatory meeting on 7 November 2022. Due to procedure regulations from the NVAO it was decided to organise the preparatory meeting online. Due to wishes from the consortium the site visit was also conducted as an online meeting. At the preparatory meeting, the panel discussed the preliminary findings, identified the most important issues for discussion, and prepared the sessions with the delegations.

The online site visit took place on 21 November 2022. The panel discussed with delegations from the management of the consortium and the programme, as well as with lecturers, other staff members, representatives from the industry, alumni and current students. The schedule of the site visit is presented in Annex 2.

Immediately after the discussions with the delegations, the panel discussed the findings and formulated its considerations and preliminary conclusions separately for each standard. These are based on the self-evaluation report of the programme, observations during the site visit and on the assessment of additional programme documents. At the end of the site visit, the chair presented the panel's preliminary conclusions to the representatives of the programme.

Based on the findings, considerations and conclusions, the secretary wrote a draft advisory report that was first presented to the panel members. After the panel members had commented on the draft report, the chair endorsed the report. On 4 January 2023, the advisory report was sent to the institution, which was given the opportunity to respond to any factual inaccuracies in the report. The institution replied on 19 January 2023 and 27 January 2023. This led to minimal adjustments of the report. Subsequently, the final report was endorsed by the panel chair. The panel drafted its advice fully independently and offered it to NVAO on 2 February 2023.

3 Description of the programme

3.1 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 ¹
Mode of study	: Fulltime
Field of study	: Technic

3.2 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; a renewed 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 technological 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.

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

3.3 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.

4 Assessment per standard

In this chapter the panel assesses 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. The criteria for each standard are mentioned. 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.

4.1 Standard 1: Eligibility

4.1.1 Status

The institutions that offer a joint programme should be recognised as higher education institutions by the relevant authorities of their countries. Their respective national legal frameworks should enable them to participate in the joint programme and, if applicable, to award a joint degree. The institutions awarding the degree(s) should ensure that the degree(s) belong to the higher education degree systems of the countries in which they are based.

Outline of findings

The JMAG programme is a two-year joint master's programme offered by a consortium of three higher education institutions in three countries: Technische Universiteit Delft (TUD; The Netherlands), Eidgenössische Technische Hochschule Zürich (ETH; Switzerland) and Rheinisch Westfälische Technische Hochschule Aachen (RWTH; Germany). All three institutions are recognised by their respective national authorities and they are degree awarding institutions. The legal frameworks in the three countries permit the institutions to establish a joint master's programme and to award a joint degree. Graduates of the programme receive a joint diploma Master of Science in Applied Geophysics, issued by the three institutions. This degree will be fully recognised by all three institutions and their respective countries.

In the self-evaluation report, the consortium describes the programme's history. The three consortium partners are members of the strategic alliance IDEA League. The new JMAG programme is a continuation of the master's programme Applied Geophysics as offered by the consortium since September 2006. Currently, that programme provides graduates a triple degree; at TUD, the programme is a track within the master's programme in Applied Earth Sciences. Recognition as a joint programme will make it possible to issue one joint diploma for the independent Master of Science in Applied Geophysics. The contents of the programme remain unchanged.

Considerations

The panel confirms that the three institutions that offer the joint programme JMAG are recognised as higher education institutions by the relevant authorities of their countries. Their national legal frameworks allow them to participate in a joint programme. The joint degree issued upon completion of the programme will be recognised as a degree in the higher education systems of each partner institution. According to the panel, the three partner institutions are internationally renowned academic research institutions.

Conclusion

The panel assesses that the JMAG programme **meets** standard 1.1, status.

4.1.2 Joint design and delivery

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

Outline of findings

The self-evaluation report states that the programme has been jointly designed, maintained and adapted by academic staff members of the three partner universities. Students spend one semester at each of the three partners, where they follow modules offered by local members of staff. In the fourth and final semester, they work on a thesis research project under the academic supervision and responsibility of one of the partners.

Each of the partners is represented in the joint bodies of the consortium: the Executive Committee, Administrative Committee and Joint Examination Board. The Executive Committee manages the programme. It oversees the content of the programme and organises a yearly evaluation. Each partner university nominates one senior academic to take a seat in this committee. The Administrative Committee supports the Executive Committee and consists of three senior administrators – one from each of the partners. A Joint Examination Board (JEB) is responsible for all decisions concerning credit examinations that are not part of the responsibilities of local Examination Boards.

During the online site visit, the panel asked for examples that show cooperation between the partner institutions at all levels. The panel learned that academic staff members of two institutions are involved in the assessment of the theses; every year, the combinations of examiners change. Lecturers mentioned that they contact colleagues at the other universities whenever they need information about e.g. modules taught elsewhere. Staff members from all three partner institutions are invited at the end of the academic year at the graduation ceremony in Delft. This is also a moment to discuss any changes in modules or the curriculum as a whole. The panel understood that not all lecturers are present at these yearly meetings. Once in about five years, the consortium organises a so-called 'retreat', where the consortium evaluates the whole programme.

Considerations

Based on the documentation and the conversations with representatives of the three institutions, the panel concludes that the JMAG programme is offered jointly by the three partner universities. All cooperating institutions are involved in the design and delivery of the programme. The contents are well-distributed among the partner institutions and there is a clear structure that indicates each partner's responsibilities. The panel noted that the three institutions complement each other with regard to their research and teaching competences.

Nevertheless, the panel remarks that many ties between the consortium members are informal and depend on individual connections between staff members. It therefore strongly recommends that the consortium creates more formal links between the three partner institutions to foster interaction between colleagues from the three locations – these should be organised for all staff members at different organisational levels and at multiple moments

throughout the year. In addition, the panel deems it essential that the teaching staff have continuous access to each other's materials.

Conclusion

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

4.1.3 Cooperation Agreement

The terms and conditions of the joint programme should be laid down in a cooperation agreement.

The agreement should in particular cover the following issues:

- *Denomination of the degree(s) awarded in the programme*
- *Coordination and responsibilities of the partners involved regarding management and financial organisation (including funding, sharing of costs and income etc.)*
- *Admission and selection procedures for students*
- *Mobility of students and teachers*
- *Examination regulations, student assessment methods, recognition of credits and degree awarding procedures in the consortium.*

Outline of findings

The consortium partners signed a renewed Cooperation Agreement in October 2022. This agreement will come into effect at the start of the new academic year (September 2023) and has unlimited validity. A partner may cancel the agreement by the end of an academic year, with a cancellation period of twelve months. During the online site visit, the panel discussed the consortium's strategy regarding possible extensions of the partnership and learned that the topic is regularly addressed, but that it is not actively pursued because the division among three universities fits the semester planning and the current partners cover the main topics in applied geophysics.

The panel studied the agreement and established that contains information about i.a. the programme's governance, administrative matters, finances, logistics and student support, degree awarding, programme documents, appeals, as well as quality assurance and accreditation.

Considerations

The panel established that the terms and conditions of the JMAG are laid down in a Cooperation Agreement. This document and its annexes cover the required topics. The panel recommends to include formal arrangements for staff mobility aimed at teaching, research and discussing programme matters.

Conclusion

The panel assesses that the JMAG programme **meets** standard 1.3, cooperation agreement.

4.2 Standard 2: Learning Outcomes

4.2.1 Level [ESG 1.2]

The intended learning outcomes should align with the corresponding level in the Framework for Qualifications in the European Higher Education Area (FQ-EHEA), as well as the applicable national qualifications framework(s).

Outline of findings

The JMAG 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. Graduates are engineers who are internationally oriented, critical and independent. They should be able to work in teams and embrace interdisciplinary ways of thinking, be prepared for lifelong learning and have continuous attention to intellectual integrity and ethics in scientific research and its applications to benefit society. The contents of the programme focus on the acquisition of fundamental knowledge of theories underlying the geophysical methodologies and their practical aspects, of the skills needed to apply this knowledge, and on learning how these are related to societally relevant topics.

The programme's objectives have been translated into twelve learning outcomes. The consortium states that the learning outcomes are in line with the four purposes of higher education as defined by the Council of Europe, the second-cycle education level as set out in the FQ-EHEA and the national frameworks for master's degrees in the Netherlands, Switzerland and Germany. In an annex to the self-evaluation report, the intended learning outcomes have been linked to the Dublin descriptors of the master's level and to the Meijers' criteria for academic curricula of technical universities.

Considerations

According to the panel, the programme's intended learning outcomes are presented in a clear way. They align with the master's level of the FQ-EHEA as well as relevant national qualifications frameworks. The panel noted that the documentation provided by the consortium indicates that fulfilment of the learning outcomes is carefully monitored.

Conclusion

The panel assesses that the JMAG programme **meets** standard 2.1, level.

4.2.2 Disciplinary field

The intended learning outcomes should comprise knowledge, skills, and competencies in the respective disciplinary field(s).

Outline of findings

The JMAG programme covers theoretical as well as practical aspects of applied geophysics. Its intended learning outcomes focus on developing and improving methodologies needed to characterise and monitor processes in the earth's subsurface. They also include skills and competencies needed in the professional field, where graduates cooperate not only with scientists but also with engineers, the public and other stakeholders. Therefore, they should be able to collaborate effectively in diverse teams and work on projects that meet the requirements of stakeholders.

The programme's intended learning outcomes have been mapped against the Dublin descriptors regarding (a) knowledge and understanding, (b) applying knowledge and understanding, (c) making judgements, (d) communication, and (e) lifelong learning skills. They have also been compared to the Meijers' criteria for academic curricula of technical universities on the aspects of (a) scientific disciplines, (b) research, (c) design, (d) scientific

approach, (e) intellectual skills, (f) co-operation and communication, and (g) temporal and social context.

The JMAG General Programme Regulations state that the programme may establish an Industrial Advisory Committee. The panel talked to representatives from the professional field in the Netherlands and understood that they are not part of such a committee. The involvement of external stakeholders seemed to be rather ad hoc and dependent on personal contacts.

Considerations

According to the panel, the JMAG programme's intended learning outcomes cover a broad and comprehensive set of outcomes that are relevant to the discipline of applied geosciences. The panel appreciates that they do not only cover theories but also practical skills that are useful in the academic and professional field. The panel advises to formally involve representatives from the international geophysics industry by establishing an Industry Advisory Committee.

Conclusion

The panel assesses that the JMAG programme **meets** standard 2.2, disciplinary field.

4.2.3 Achievement [ESG 1.2]

The programme should be able to demonstrate that the intended learning outcomes are achieved.

Outline of findings

The self-evaluation report includes a table that relates the programme's mandatory and elective modules to the intended learning outcomes. This table also provides information about the end-level assessment. Students show the achievement of learning outcomes in the modules as well as the research project. During the online site visit, the panel learned that the local Boards of Examiners regularly check whether the local modules address the intended learning outcomes.

Eight of the twelve intended learning outcomes are assessed at end-level during the master thesis project. The other four are addressed in other mandatory modules. Students who wish to follow an elective outside of the prescribed list need to ask permission from the JEB in order to assure that all students meet all intended learning outcomes. The panel noted that it is possible for students to create a personal study plan that includes all intended learning outcomes but not all at end-level if they choose a specific combination of mandatory modules.

Considerations

The panel is of the opinion that the intended learning outcomes are adequately addressed and assessed in the programme. The programme employs fitting assessment methods to measure whether students have achieved the intended learning outcomes. The panel advises that the JEB checks more carefully that graduates have indeed achieved all intended learning outcomes at end-level.

Conclusion

The panel assesses that the JMAG programme **meets** standard 2.3, achievement.

4.2.4 Regulated Professions

If relevant for the specific joint programme, the minimum agreed training conditions specified in the European Union Directive 2005/36/EC, or relevant common trainings frameworks established under the Directive, should be taken into account.

Outline of findings

This standard is not relevant for the assessment of the JMAG programme.

Conclusion

The panel issues no conclusion because standard 2.4, regulated professions, is not applicable.

4.3 Standard 3: Study Programme [ESG 1.2]

4.3.1 Curriculum

The structure and content of the curriculum should be fit to enable the students to achieve the intended learning outcomes.

Outline of findings

The JMAG curriculum consists of four semesters, each with a nominal study load of 30 ECTS credits. Students follow modules during the first three semesters and work on an individual research project that leads to a master thesis report in the final semester. Each partner university offers a set of mandatory and elective modules related to applied geophysics. The modules at TUD address fundamental theory; this knowledge is deepened and applied in modelling and field work at ETH. At RWTH, students further deepen and integrate their expertise. All modules offered at TUD are specific to the JMAG programme. At ETH all courses are also offered within the Department of Earth Sciences and at RWTH only one course is specific to the JMAG programme.

In the self-evaluation report, the consortium has listed the recommended study programme and linked the modules to the programme's intended learning outcomes. In addition, students may follow so-called 'free electives' at other departments upon approval of the JEB. Students should obtain a minimum of 24 ECTS credits at each partner university but may decide to follow more than 30 ECTS credits during one semester if the modules of their host university are especially appealing to them. This flexible structure allows students to create their own study profile.

The programme addresses the full spectrum of applied geophysics, including exploration and production, civil engineering applications, environmental applications, as well as water applications both in general and in cold regions. During the online site visit, the representatives from the professional field emphasised that they value that programme does not only address the greater depths but also more shallow depths and current issues such as renewables and energy transition.

Initially, the panel was concerned that the modules offered at TUD and ETH would lead to overlap in content and students repeating certain content. However, during the site visit the lecturers explained that they discuss any possible changes to the curriculum at the yearly meeting in Delft and thus aim to avoid any unnecessary redundancies. They also convincingly argued that some minimal overlap will remain to bring students to the same level of

background knowledge before a new module goes deeper into theory or applies this knowledge in field work.

During the fourth and final semester, students work on a master thesis research projects, which are offered by the partner universities and companies. The JEB compiles a list of project proposals and makes this list available to students during their third semester. Before the students specify their preferences, the partner universities and companies give short presentations about their projects and students may schedule interviews with companies in case they are interested in a specific project. The JEB then assigns projects to the students. Students who work on a project offered by a company do so under the academic supervision and responsibility of one of the consortium partners.

Considerations

The panel commends the programme for its well-structured curriculum, that enables students to achieve the intended learning outcomes. According to the panel, the mandatory modules form a coherent set of modules that cover the entire spectrum of relevant knowledge and skills in the field of applied geophysics. The panel was satisfied by the way the staff members avoid too much overlap between modules delivered at different locations.

Conclusion

The panel assesses that the JMAG programme **meets** standard 3.1, curriculum.

4.3.2 Credits

The European Credit Transfer and Accumulation System (ECTS) should be applied properly and the distribution of credits should be clear.

Outline of findings

The Cooperation Agreement indicates that the JMAG programme follows a credit system that is aligned with the European Credit Transfer and Accumulation System (ECTS). The workload of modules and of the programme as a whole is expressed in European Credits (ECTS credits). In total, the study load of the two-year programme amounts to 120 ECTS credits. The partner institutions offer mandatory and elective modules, each with study loads ranging from 3 to 9 ECTS credits. The nominal study load per semester is 30 ECTS credits; during the first three semesters, the minimum study load per semester is 24 ECTS credits. This gives students the flexibility to compose a curriculum that fits their interests. The final thesis research project has a total of to 30 ECTS credits.

Considerations

The panel confirms that the JMAG programme applies the ECTS. The credits have been distributed clearly across the curriculum and among the partner institutions.

Conclusion

The panel assesses that the JMAG programme **meets** standard 3.2, credits.

4.3.3 Workload

A joint bachelor programme will typically amount to a total student workload of 180-240 ECTS credits; a joint master programme will typically amount to 90-120 ECTS credits and should not be

less than 60 ECTS credits at second cycle level (credit ranges according to the FQ-EHEA); for joint doctorates there is no credit range specified.

The workload and the average time to complete the programme should be monitored.

Outline of findings

The curriculum of the JMAG programme comprises 120 ECTS credits and is divided into four semesters. Students must obtain a minimum of 24 ECTS credits at each institution, giving students some flexibility in the distribution of the workload depending on their individual study plan. Monitoring the programme's workload is part of the consortium's evaluation cycle. Over the years, adjustments have been made based on experiences and students' feedback. The current programme has high success rates and most students graduate in nominal time. Delays in graduation are limited to a maximum of six months.

Considerations

The panel confirms that the JMAG programme's workload is in line with FQ-EHEA's prescriptions. Based on the consortium's experience in the programme's predecessor, the panel concludes that the workload and time to complete the programme are monitored in an adequate way.

Conclusion

The panel assesses that the JMAG programme **meets** standard 3.3, workload.

4.4 Standard 4: Admission and Recognition [ESG 1.4]

4.4.1 Admission

The admission requirements and selection procedures should be appropriate in light of the programme's level and discipline.

Outline of findings

The consortium has set up an admission procedure that involves all partner universities. TUD coordinates the administrative aspects of admission; applicants register via TUD's application system. In addition, the JMAG programme follows TUD's admission requirements: a suitable bachelor's degree with a cumulative grade point average of at least 75% and proof of English language proficiency. The International Office in Delft screens all applications and forwards admissible applications with the International Office's advice to the Admission Committee. This committee consists of one academic staff member from each partner institution and decides on the admission of each candidate, taking into account the applicant's academic history. Due to practical reasons related to the organisation of field work, the programme has a limit of 40 students.

After the Admission Committee's approval, TUD's International Office handles further admission. Throughout the programme, all JMAG students are registered in Delft and pay TUD's tuition fees. TUD arranges the registration at the partner institutions to ensure that students have access to services and facilities in Zürich and Aachen. The programme intends to attract an international student body, with students from the European Higher Education Area (EHEA) as well as students from other countries. TUD's International Office has ample experience in providing assistance to students who need to apply for visa. Students may apply for scholarships and/or an Erasmus+ exchange grant for their final semester in Aachen.

Considerations

The panel is of the opinion that the programme applies appropriate admission requirements and a transparent selection procedure. These are described in the documentation and were adequately illustrated during the online site visit. They support the formation of a balanced group of students coming from the EHEA and other parts of the world. All three partner institutions are involved in the selection procedure, while the programme can rely on the experience of TUD's International Office in handling student administration.

Conclusion

The panel assesses that the JMAG programme **meets** standard 4.1, admission.

4.4.2 Recognition

Recognition of qualifications and of periods of studies (including recognition of prior learning) should be applied in line with the Lisbon Recognition Convention and subsidiary documents.

Outline of findings

The Admission Committee assesses student applications based on the students' academic backgrounds and language proficiency. During the online site visit, the programme management explained that, in case of doubt, the members of the Admission Committee discuss the application – this is done usually within one week after the application has become available. Rejected applicants may issue an appeal if they do not agree with the Admission Committee's decision.

All three partner universities monitor students' progress in order to award the joint degree upon successful completion of the programme. The consortium employs a mark exchange table for the three different marking systems in the Netherlands, Switzerland and Germany. This table is part of the Diploma Supplement connected to the joint degree.

Considerations

The panel confirms that the recognition of previous qualifications and prior learning is adequately provided for in the JMAG programme.

Conclusion

The panel assesses that the JMAG programme **meets** standard 4.2, recognition.

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

4.5.1 Learning and Teaching

The programme should be designed to correspond with the intended learning outcomes, and the learning and teaching approaches applied should be adequate to achieve those. The diversity of students and their needs should be respected and attended to, especially in view of potential different cultural backgrounds of the students.

Outline of findings

In order to enable students to achieve the intended learning outcomes, the programme intends to stimulate students' thinking process. The programme has been designed with a student-centred approach and in line with McHenry's model for constructive learning and teaching. It lets students actively acquire knowledge: they come up with questions to deepen

their knowledge and build a coherent volume of connected knowledge that makes acquiring new knowledge easier. During field work, students are encouraged to implement their own ideas and discuss any problems they run into with their peers. The programme uses a variety of teaching methods, from self-study to project assignments, and strives to create multidisciplinary connections by means of the modular curriculum and the application of team-teaching.

Each cohort of students studies spends three semesters together at the three partner institutions. Thus, the programme fosters group forming. Because of the relatively small size of the programme, it will be easy for students and staff to contact each other. Students gain experience with working in an international environment in the programme's international classroom, where they cooperate with fellow students from within and outside Europe. The academic staff members also have ample international experience.

Considerations

The panel concludes that the programme has been designed in line with the intended learning outcomes. The teaching and learning approaches applied are adequate to achieve these learning outcomes and stimulate students' thinking process. The programme is motivated to turn the diversity of its student population into an asset for the entire programme. The panel appreciates that the students move from one institution to the next as one group, which likely contributes to them feeling 'at home' at the different locations.

Conclusion

The panel assesses that the JMAG programme **meets** standard 5.1, learning and teaching.

4.5.2 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.

Outline of findings

The programme uses a variety of assessment methods, ranging from written exams to presentations and reports. The programme believes that it is important that students understand how they will be assessed and how the learning and teaching activities are in line with assessments. According to the self-evaluation report, this encourages students to engage themselves in the learning activities and it helps them to understand that they can pass their exams. Information about assessment is published in the modules' study guides. Most modules include mock exams or self-test materials that allow students to prepare for their examinations.

For the examination of modules, the programme follows the local rules of the institution that offers a certain module. These are enforced by the Board of Examiners (TUD, RWTH) or the Director of Studies (ETH) and adhere to the national legal framework of the partner university. Students who need to take a resit exam, may do so at the subsequent institution, in order to minimise study delays. The number of resits allowed differs per institution, in line with the local examination rules. If necessary, students may take an alternative module. Students who disagree with an examiner's decision may appeal to the Examination Appeals Board (CBE; TUD, RWTH) or the Vice Rector for Study Programmes (ETH).

Members of the local Boards of Examiners have a seat in the JEB to ensure consistent treatment. They have frequent contact with each other to discuss any current affairs. From the self-evaluation report, the panel understood that the JEB deals with overarching matters and applies its own rules to determine whether a student has fulfilled the programme's intended learning outcomes. However, in the annex General Programme Regulations, the panel read that the local regulations apply in case of all appeals except admission. This suggests that students may be treated differently in the master thesis, depending on where they work on their project. As an example, the panel addressed the involvement of examiners. All master theses are assessed by at least two examiners. At TUD, however, at least three examiners are involved because TUD requires examiners to have obtained a University Teaching Qualification (UTQ), which most of the colleagues at ETH do not have because such a requirement does not exist at ETH. The panel discussed this topic with the programme's representatives. The programme directors eventually explained that the annex refers to the current situation, but that the programme intends to develop new, common regulations for the organisation and assessment of the thesis project. These regulations are not yet ready.

Considerations

The panel is of the opinion that, overall, the examination regulations and assessment procedures are sufficiently clear and the assessment corresponds with the intended learning outcomes. The panel appreciates the variety of assessment methods and thinks that the exams show an appropriate level for a master's programme in applied geophysics.

The consortium members apply their local regulations for parts of the programme that they provide. The panel considers this appropriate for the assessment of modules. However, the panel deems it necessary that the programme formalises the examination regulations for joint components of the programme, such as the thesis project. The programme should decide how the theses will be assessed, by using local or a common set of regulations, and this must be communicated clearly to students at the beginning of the programme.

Conclusion

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

4.6 Standard 6: Student Support [ESG 1.6]

The student support services should contribute to the achievement of the intended learning outcomes. They should take into account specific challenges of mobile students.

Outline of findings

The consortium partners strive to be a safe, diverse and inclusive learning and working environment for all staff and students. The JMAG programme offers student support services at the programme level and at the individual level, including guidance, coaching, counselling and career services. At all three partner universities, students may use the local student support and learning facilities. Local programme coordinators are a first point of contact and may redirect students to colleagues. Academic tutors and module instructors help students with any issues regarding the content of the programme. Academic counsellors handle general questions related to personal matters and may refer students to a student counsellor,

psychologist or an external professional. TUD's International Office supports students in moving from one university to the next.

At the start of the first semester, students are introduced to the programme, TUD and the city of Delft. The programme coordinator informs the students about the support that is available to them. Students are also informed about diversity and inclusion policies and meet student ambassadors, who organise events to foster social cohesion among the group of international students. Prior to the second semester, ETH organises an online introduction session to prepare the students for their time in Zürich. Upon arrival, the local programme coordinator welcomes the students and explains how students may find relevant facilities. A similar procedure is employed around the start of the third semester. Thus, the consortium aims to create continuity.

During the online site visit, the panel discussed the support offered in finding housing. The programme's management clarified that students are responsible for finding accommodation for the first semester, although TUD's Housing Office offers some help to students who apply early. ETH guarantees housing for all students in Zürich and RWTH may arrange accommodation for the majority of students.

Considerations

The panel comes to the conclusion that the consortium has a well-structured plan for student support at each institution. The partner universities offer a wide range of services to its students while they study at one of the partners as well as in the transition from one location to the next. They have fitting procedures for welcoming students at their new host university. Considering the housing situation in Delft, the panel urges TUD to inform prospective students early about alternative ways of finding accommodation. The panel commends ETH and RWTH for the efforts made to arrange accommodation and recommends that TUD develops similar options for Dutch students who wish to spend their final semester in Delft. For non-Dutch students, TU Delft guarantees housing during their final semester.

Conclusion

The panel assesses that the JMAG programme **meets** standard 6, student support.

4.7 Standard 7: Resources [ESG 1.5 & 1.6]

4.7.1 Staff

The staff should be sufficient and adequate (qualifications, professional and international experience) to implement the study programme.

Outline of findings

The programme is implemented by a core team of academic staff members who are supported by junior lecturers, postdocs and PhD candidates. The self-evaluation report provided an overview of the qualifications of the teaching staff. They have international research and teaching experience and are active researchers in relevant disciplines. The institutions follow their local regulations for recruiting new staff members and staff development. TUD encourages team-teaching and offers its staff training on this topic.

In the self-evaluation report, the consortium remarked that the three consortium members have different policies regarding the didactic qualifications. All instructors from TUD and RWTH have obtained a University Teaching Qualification (UTQ) or equivalent, but such a requirement does not exist at ETH. The panel discussed this finding with the JMAG management and lecturers and learned that ETH uses student evaluations, weekly information sessions and peer consultation to support staff members in the development of their teaching skills.

Considerations

The panel concludes that the JMAG has a sufficient and well-qualified body of academic staff members who develop and implement the programme. The staff members have relevant backgrounds that are related to the programme's curriculum.

According to the panel, it would be beneficial if the staff members of the three institutions shared their experiences and expertise regarding didactics with each other. The panel therefore recommends that the programme investigates how the teachers from the three institutions may collaborate on this matter, inform each other about the requirements at the three institutions, discuss them and include peers in the assessment of colleagues.

Conclusion

The panel assesses that the JMAG programme **meets** standard 7.1, staff.

4.7.2 Facilities

The facilities should be sufficient and adequate in view of the intended learning outcomes.

Outline of findings

JMAG students may use all the services and facilities that are available for all students at the three institutions. The self-evaluation report describes the academic facilities in Delft, Zürich and Aachen. These include self-study places, group rooms, computer rooms, laboratory space and equipment for fieldwork. Students may use the universities' physical and digital libraries, as well as wider IT infrastructure including software packages with student licenses.

Considerations

According to the panel, the consortium partners provide all necessary resources and facilities to provide a high-quality learning environment for students. They support the students in achieving the intended learning outcomes. The panel especially appreciates the availability of instruments for practical (field) work.

Conclusion

The panel assesses that the JMAG programme **meets** standard 7.2, facilities.

4.8 Standard 8: Transparency and Documentation [ESG 1.8]

Relevant information about the programme like admission requirements and procedures, course catalogue, examination and assessment procedures etc. should be well documented and published by taking into account specific needs of mobile students.

Outline of findings

The self-evaluation and its annexes provided the panel with relevant information regarding the JMAG programme. Prospective students may find general information about the programme, its application procedure and scholarships on the IDEA League website. The General Programme Regulations specify the programme's governance, admission, curriculum, registration for courses, examination, grading systems, master thesis, graduation and appeals. Information about modules may be found in course catalogues, module descriptions and the learning management systems Brightspace (TUD) and Moodle (ETH and RWTH). Students retain access to these platforms when they move to the next partner institution. Current students mentioned that, at times, the course descriptions for electives may be difficult to find and that course descriptions at RWTH are sometimes only available in German.

Considerations

The panel confirms that all necessary information is available to applicants and students. Considering the remarks of current students, the panel recommends to create one uniform platform where students may find all relevant materials. Course descriptions and syllabi for both mandatory and elective courses should be available in English at all partner institutions and ideally follow a standardised format to make it easier to find relevant information.

Conclusion

The panel assesses that the JMAG programme **meets** standard 8, transparency and documentation.

4.9 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.

Outline of findings

The self-evaluation report states that the three consortium members employ their own quality assurance procedures and that they have confidence in each other's quality assurance policies. The quality assurance is assessed at the institutional level at all three partner universities. Modules are evaluated at least every three years by means of student evaluations. In addition, instructors evaluate ongoing modules by talking with their students. The Executive Committee organises a student evaluation at the end of a term to assess the quality of the programme as a whole.

The panel considered this description to be rather limited and discussed this topic extensively during the online site visit. These discussions confirmed that the consortium does not have a quality assurance procedure for the overarching components of the programme and that the quality assurance staff members do not collaborate. The partner universities apply their own procedures; results are sent to the Executive Board but do not seem to be shared with other stakeholders such as students.

Considerations

The panel is of the opinion that, individually, the consortium members have appropriate quality assurance processes in place. The institutions employ a diverse set of evaluation techniques that regularly assess the quality of education and involve relevant stakeholders. Nevertheless, the panel strongly recommends that the partner institutions 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. They should discuss the outcomes in order to learn and further improve the programme. The panel stresses that all three institutions are equally responsible for the programme and therefore need to know and are accountable for what happens at the other universities. This also encourages the institutions to learn from each other. In addition, the communication of results towards stakeholders requires further attention.

Conclusion

The panel assesses that the JMAG programme **partially meets** standard 9, quality assurance.

4.10 Duration of the programme

In the self-evaluation report, the JMAG consortium provides two arguments for the study load of 120 ECTS credits. Firstly, this duration is in line with the international standard for master's programmes in engineering, including those programmes offered by the three consortium partners. Secondly, the programme claims that only a two-year programme can enable students to achieve the broad set of intended learning outcomes and be competitive in the international job market. The panel agrees with this argumentation and therefore recommends a study duration of 120 ECTS credits for the JMAG programme.

4.11 Degree, field of study and review group:

The panel advises awarding the following degree to the new programme: Master of Science;
The panel supports the programme's preference for the following field of study: Technology;
The panel supports the programme's preference to join the following review group (*visitatiegroep*): WO Earth Sciences (WO Aardwetenschappen).

4.12 Conclusion

The panel concludes that the JMAG is a relevant programme that 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. The programme covers theoretical as well as practical aspects in order to prepare students for a career in academia or the industry.

The panel established that the programme's intended learning outcomes align with the master's level and cover a broad and comprehensive set of outcomes that are relevant to the discipline of applied geosciences. They have been incorporated in a well-structured and coherent two-year curriculum of 120 ECTS credits. The panel agrees with the consortium that this is a fitting study duration for this master's programme. Students follow modules during the first three semesters and work on an individual research project that leads to a master thesis report in the final semester. Well-qualified academic staff members develop and implement the programme. The staff members have relevant backgrounds that are related to the programme's curriculum as well as ample international experience.

The programme applies appropriate admission requirements and has a transparent selection procedure that involves all consortium members. They support the formation of a balanced group of students coming from the EHEA and other parts of the world. The consortium has a

well-structured plan for student support and offers relevant services to its students while they study at one of the partners as well as in the transition from one location to the next. All partner universities have fitting procedures for welcoming students at their new host university. The panel appreciates that the students move from one institution to the next as one group, which likely contributes to them feeling 'at home' at the different locations.

The panel is of the opinion that, overall, the examination regulations and assessment procedures are sufficiently clear and the assessment corresponds with the intended learning outcomes. The consortium members apply their local regulations for parts of the programme that they provide. The panel considers this appropriate for the assessment of modules. However, the panel deems it necessary that the programme formalises the examination regulations for joint components of the programme, such as the thesis project.

The panel is convinced that, individually, the consortium members have appropriate quality assurance processes in place, but the panel strongly recommends that the partner institutions set up formal quality assurance procedures for the joint components of the programme. They should also inform each other about the outcomes of their own quality assurance procedures. The panel stresses that all three institutions are equally responsible for the programme and therefore need to know what happens at the other universities. This also encourages the institutions to learn from each other.

Moreover, the panel states that the consortium members should cooperate more on other aspects. Many ties between the consortium members are informal and depend on individual connections between staff members. The panel therefore strongly recommends that the consortium creates more formal links between the three partner institutions to foster interaction between colleagues from the three locations – these should be organised for all staff members at different organisational levels and at multiple moments throughout the year. In addition, the panel deems it essential that the teaching staff have continuous access to each other's materials.

Overall, the panel comes to a conditionally positive conclusion about the quality of the joint master's programme Applied Geophysics. The panel has formulated the following conditions:

1. 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.
2. 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.
3. 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.

5 Overview of the assessments

Standard	Judgement
1. Eligibility	
1.1 Status	Meets the standard
1.2 Joint design and delivery	Partially meets the standard
1.3 Cooperation Agreement	Meets the standard
2. Learning Outcomes	
2.1 Level	Meets the standard
2.2 Disciplinary field	Meets the standard
2.3 Achievement	Meets the standard
2.4 Regulated Professions	Not applicable
3. Study Programme	
3.1 Curriculum	Meets the standard
3.2 Credits	Meets the standard
3.3 Workload	Meets the standard
4. Admission and Recognition	
4.1 Admission	Meets the standard
4.2 Recognition	Meets the standard
5. Learning, Teaching and Assessment	
5.1 Learning and teaching	Meets the standard
5.2 Assessment of students	Partially meets the standard
6. Student Support	
	Meets the standard
7. Resources	
7.1 Staff	Meets the standard
7.2 Facilities	Meets the standard
8. Transparency and Documentation	
	Meets the standard
9. Quality Assurance	
	Partially meets the standard
Conclusion	Conditionally positive

6 Commendations

The programme is commended for the following features of good practice.

1. Curriculum – The programme has a coherent curriculum, that covers the entire spectrum of relevant knowledge and skills in the field of applied geophysics and enables students to achieve the intended learning outcomes.
2. Cohorts – The programme turns the diversity of its student population into an asset for the entire programme and makes students feel ‘at home’ by letting the students move as a group from one institution to the next.
3. Student support – The programme has a well-structured plan for student support at each institution, including services to support students in moving to the next university and fitting procedures for welcoming students at their new host university.
4. Staff – The academic staff members are well-qualified to develop and implement the programme. They have diverse and relevant backgrounds as well as international experience.

7 Recommendations

For further improvement to the programme, the panel recommends a number of follow-up actions.

1. Cooperation – 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.
2. Teaching expertise – Investigate how the teachers from the three institutions may collaborate on the topic of didactics and teaching expertise, so they can inform each other about the requirements at the three institutions, discuss them and include peers in the assessment of colleagues.
3. Examination – 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.
4. Quality assurance – 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
5. Course descriptions and syllabi - Create one uniform platform where students may find all relevant materials. Course descriptions and syllabi for both mandatory and elective courses should be available in English at all partner institutions and ideally follow a standardised format to make it easier to find relevant information.

Annex 1: Composition of the panel

- 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);
- 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);
- Sena Çatal (student), 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.

Annex 2: Schedule of the site visit

On 21 November 2022, the panel organised an online site visit as part of the external assessment procedure of the joint master's programme in Applied Geophysics (JMAG). The schedule of the visit was as follows:

08:30 – 09:00	Document study (closed panel session)
09:00 – 09:45	Dean, director of education and programme directors Dean of faculty CEG (TUD), director of education CEG (TUD), programme directors JMAG (RWTH, TU, ETH)
10:10 – 11:10	Lecturers Staff members from TUD, RWTH and ETH
11:35 – 12:05	Professional field representatives Fugro, Shell, League Geophysics
13:05 – 13:50	Board of examiners / quality assurance Members of the Joint Board of Examiners (TUD, ETH, RWTH) and QA staff member (TUD)
14:15 – 15:00	Alumni and students Two alumni and three active JMAG students
15:25 – 15:55	Extra session to discuss pending issues Management Board
17:25	Presentation of the main findings by the panel chair

Annex 3: Documents reviewed

Programme documents presented by the institution

1. Application for initial accreditation MSc Applied Geophysics (Self-Evaluation Report)
2. Annexes:
 1. Cooperation Agreement Joint AGP
 2. ILOs linked to Dublin Descriptors and Meijers' criteria
 3. Module description master thesis
 4. Coverage ILOs in the programme
 5. Module descriptions:
 - 5.1. Module descriptions Applied Geophysics TUD Delft
 - 5.2. Module descriptions Applied Geophysics ETH Zürich
 - 5.3. Module descriptions Applied Geophysics RWTH Aachen
 6. Assessment programme AGP (overview of summative assessments)
 7. Overview Board of Examiners
 8. Overview teaching staff
 9. General Program Regulations

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

The full report was written at the request of NVAO and is the outcome of the peer review of 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-1437



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