AQ Austria, 1190 Wien, Franz-Klein-Gasse 5

Agentur für Qualitätssicherung und Akkreditierung Austria

Review Report of the Expert Panel on the Joint Programme

Copernicus Master in Digital Earth

European Approach for Quality Assurance of Joint Programmes Accreditation

Version 13th April, 2022

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1 General Information

1.1 Basic principles of the procedure

AQ Austria is the Austrian agency for quality assurance and accreditation in higher education. The agency is operating in Austria and other countries of the European Higher Education Area (EHEA). It is committed to serving the common good and is based on the values of the EHEA, in particular the autonomy and diversity of higher education institutions and independent quality assurance.

By granting accreditation to joint programmes, AQ Austria confirms the compliance of the joint study programme *with Standards for Quality Assurance of Joint Programmes in the EHEA (European Approach)*.

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9. Quality Assurance [ESG 1.1 & part 1]	

The accreditation pursues the principles of peer review and follows the procedural steps:

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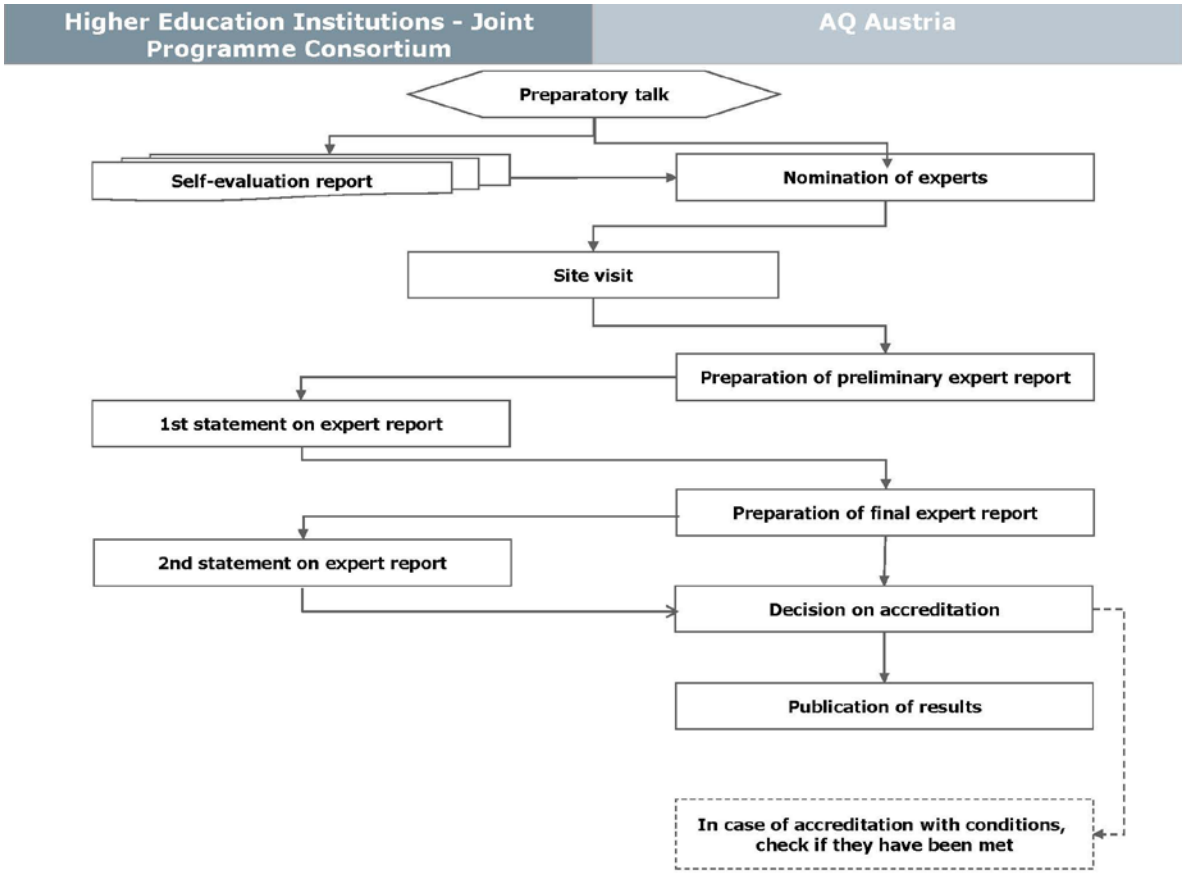

The review report of the expert panel and the consortium's statement constitute the basis for the accreditation decision, which is taken by the 14-members-board of AQ Austria. There are three options for the decision:

Accreditation without conditions

The quality requirements are being met. Any recommendations given on the basis of expert opinion are supposed to help the higher education institution/project consortium to continuously develop the joint programme.

Accreditation with conditions

Accreditation with conditions will be granted if the joint programme shows an acceptable level across the standard's overall spectrum. However, standards have been assessed as "not met" because deficiencies have been detected which are likely to be corrected within nine months. Within nine months the higher education institution/project consortium proves that the conditions have been met, and this will be verified by AQ Austria. As a rule, at least one review panel member will be involved in examining whether the conditions are fulfilled.

Denial of accreditation

Accreditation will be denied when the joint programme shows serious identifiable shortcomings. This applies when standards have been assessed as "not met" and deficiencies detected are not likely to be corrected within nine months.

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1.2 Accreditation procedure for Copernicus Master in Digital Earth

Procedural step	Date
Delivery of self-evaluation report by consortium lead partner PLUS	16 March 2021
Decision on expert panel members by the Board of AQ Austria	3 November 2021
Briefing and training of review panel by AQ Austria	December 2021– January 2022
Virtual site visit by the expert panel	8 February 2022
Draft review report of the expert panel	16 March 2022
Statement on the first draft report by Consortium	05 April 2022
Final report of the expert panel	13 April 2022
Statement on the final report by consortium	If necessary
Accreditation decision by the Board of AQ Austria	20 May 2022

1.3 Members of the Expert Panel

The Board of AQ Austria has appointed a four-member Expert Panel:

Name	Institution	Role
Prof. Diofantos Hadjimitsis	Cyprus University of Technology	Head of the expert panel Expert from academia
Prof. Maria Brovelli	Politecnico di Milano	Expert from academia
Ass.-Prof.in Mag.a Dr.in Manuela Hirschmugl	Joanneum Research	Expert from pertinent professional field
Dipl.-Phys. Philipp Jaeger	Universität Wuppertal & University of Manitoba, Canada	Student Expert

AQ Austria project coordinators: Dr.in Maria E. Weber and Mag.a Notburga Damm

2 Description of the joint programme

2.1 Consortium partner of the study programme

Consortium Partner Universities
1. Paris-Lodron University Salzburg (PLUS), Department of Geoinformatics-Z_GIS, Salzburg/Austria 2. University of South Brittany (UBS), Department Informatique, Vannes/France 3. Palacký University Olomouc (UPOL), Faculty of Science – Department of Geoinformatics, Olomouc/Czech Republic

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2.2 Profile of the joint study programme subject to accreditation

Information on the accreditation application	
Name of the degree programme	CDE - Copernicus Master in Digital Earth
Type of the degree programme	Joint Masterprogramme (Erasmus+ EMJMD)
ECTS-credits	120
Normal period of studies	4 semester
Number of study places	30 enrolments per year per cohort
Academic degree(s)	Double Degree • Master of Science, MSc (PLUS & UPOL) • Master of Science, Master Informatique parcours GeoData Science (PLUS & UBS)
Organisational form	full time
Language/s used	English
Site at which the degree programme is offered	Salzburg/Austria, Paris-Lodron University Salzburg (PLUS) Vannes/France, University of South Brittany (UBS) Olomouc/Czech Republic, Palacký University Olomouc (UPOL)
Tuition fees	• Euro 9.000,- entire study period (programme country students) • Euro 14.500,- entire study period (partner country students) • Erasmus+ EMJMD scholarships

3 Introductory remarks by the review panel

The expert panel wishes to express its satisfaction with the fruitful cooperation it has had during this accreditation process, including the virtual site visit with the CDE Consortium and particularly with the representatives of the Paris-Lodron University of Salzburg (PLUS), who organized the virtual site visit in a very efficient and productive way on behalf of the Consortium. The expert panel wishes to express its appreciation to all the participants during the virtual site visit that enabled an excellent interaction.
The expert panel requested from the Consortium prior to the virtual site visit to receive further written evidence/explanation

- respective the national legal framework documents that allow the Consortium Partners to participate in the joint program and, if applicable, to award a joint degree.
- list of recent key publications, recent funded projects and recent information on H-indices, Scopus indices for key staff
- short videos on the key facilities/infrastructures (laboratories, etc.) relevant and necessary for the implementation of the joint program
- general statistical information of the joint program, such as actual student numbers (intake), student progress reports, and, if available, results from graduate surveys.
- results from module evaluations (evaluations of two to three modules with different course types), results from workload evaluations or other information or data explaining ECTS-credits allocation
- competences profile of the graduates

The expert panel was satisfied with the information provided by the Consortium on the above points, with exception of one pending issue about the UBS accreditation status. This issue was partially clarified by the UBS representative during the virtual site visit. However, the Consortium provided a written clarification on 21st February 2022 about the UBS accreditation status. The expert panel found this clarification satisfactory.

4 Statements and Assessments

4.1 Standard 1 Eligibility (1.1 – 1.3)

Eligibility
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.

Review Panel assessment: The standard is met.

Statement
The expert panel received all the necessary information concerning this standard, upon additional request to the CDE Consortium for further written evidence and explanation prior to the site visit. Indeed, during the interview the expert panel asked for further clarifications regarding the accreditation status of the GeoData Science (GeoDSc) track under the auspices of the MSc programme of Computer Science of the UBS (France) and requested the Consortium to provide more written clarifications, after the site visit.
The expert panel concludes, based also on the written response from the Consortium on the 21/2/2022 that no gaps appear in the accreditation process and status of UBS.
Based on the information provided in the self-evaluation report (SER), the evidence provided prior to the site visit and especially also during the interviews, the expert panel can thus conclude that the three participating universities meet basic prerequisites for participation in this programme and has no doubt that this standard is met:

- they are all officially recognized and registered as higher education institutions by the relevant authorities of their countries;
- they are entitled, according to their respective national legal frameworks, to participate in a joint master programme;
- and they are also entitled to issue a joint degree, while this degree belongs to the higher education degree systems of the respective countries. Currently they issue double degrees but the Consortium strives to award a joint degree.

Recommendation
The expert panel fully supports the Consortium in their efforts to move to a full joint degree awarding system and wants to recommend taking all necessary steps in this direction.

Eligibility
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.

Review Panel assessment: The standard is met.

Statement
The expert panel found in the SER, and learned in the interviews with the Project Management Board of the joint programme that the programme is a joint endeavour of all the participating universities and learned about the 'solid' motivation behind the development of this programme.
The expert panel found from the SER and from the virtual site visit, that all three aspects of the standard have been met. These tree aspects are: (i) joint offering, (ii) joint design and (iii) joint delivery.
The expert panel found during the virtual site visit that there is an existing strong collaboration between the Consortium members on the joint design and delivery of the programme.
Indeed, the CDE study programme has been designed prior to the start of studies as this has been a formal requirement for the project proposal submission for Erasmus Mundus funding.
The expert panel learned from the SER and the site visit that the joint development clearly shows in the joint curriculum, the provided study paths and the co-supervision of the students.
The expert panel saw, that the programme is jointly offered through a dedicated website including all Consortium partners.

The expert panel found that the jointness of the CDE study programme as a joint programme is well explained in the SER and the joint approach was fully explained by the Project Management Board during the virtual site visit. The programme is a one well-coordinated, well-structured programme offered to students with mutual agreed approaches between the three universities. Indeed, this gives students the opportunity to follow a common curriculum, starting with Earth Observation and Geoinformatics courses at PLUS for the first two semesters and then continuing with a specialization track at UBS or UPOL in the second year. This approach is leading to a master thesis in line with the respective track and co-supervised by PLUS and the partner university. Graduates from the CDE study programme receive double degrees awarded by PLUS and UBS, or PLUS and UPOL. The expert panel learned during the site visit that all partners, students and alumni are satisfied with this well delivered joint approach.

Regarding the joint delivery of the programme, the expert panel found that this aspect of the standard is also met. During the virtual site visit the expert panel learned that all partners are satisfied with the shared responsibilities during the joint delivery of the programme. Indeed, the panel experts learned during the interviews with the representatives of the Student Board and alumni that the students are fully satisfied with the joint delivery of the programme.

The expert panel found that the preparatory course (Orientation Project) at the beginning of the first semester is an important and successful element of the curriculum, with which also the students are very satisfied. Finally, some other joint activities such as team teaching between the faculties of the partners, organization of short intensive programmes, faculty exchange, joint webinars, joint supervision of master theses and joint participation in the governance of the programme contribute significantly to the successful delivery of the programme.

During the virtual site visit, the expert panel had the opportunity to learn from the lecturers and students how the programme has been delivered under COVID-19 conditions. Indeed, the expert panel was fully satisfied since the Consortium makes use of several on-line tools such as Microsoft TEAMS, MOODLE etc. and learned during the meeting that the Consortium takes all the necessary actions for the smooth run and delivery of the programme.

Eligibility

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.

Review Panel assessment: The standard is met.

Statement

The expert panel found that the SER provides sufficient and complete information with regard to all the aspects of this standard. There are well-defined references in the SER to recommended issues in the Consortium agreement, except from one minor issue regarding the accreditation status of the programme at UBS, which has been further clarified and elaborated during and after the interview with the Project Management Board members. The expert panel concludes that all the aspects of this standard are met.

1. Indeed, the expert panel found from the SER that **the denomination of the degree(s)** awarded in the programme is fully covered under the '*Legal Framework'* element of the CDE Consortium Agreement and was fully explained and clarified during the virtual site visit. The legal framework lays down national study and curricula regulations, based on the joint proposal as well as on joint rights and obligations. The degree awarded for studies at PLUS is nationally recognized as 'Master of Science (MSc)'; the degree awarded for studies at UBS as 'Master Informatique parcours GeoData Science', is nationally accredited; and the degree awarded for studies at UPOL is nationally recognized as national 'Master Degree/ Follow up Master Degree/ Geoinformatics and Cartography'.

2. The expert panel found from the SER that the **coordination and responsibilities of the partners involved regarding management** is fully covered and stated under '*Roles and Duties*' & '*Consortium Management Framework'* elements of the CDE Consortium Agreement.
   Moreover, this aspect of the standard was well explained during the interview with the representatives of the executive management under the Quality Assurance aspect. PLUS is the operational administrative entity coordinating the Erasmus+ EMJMD project. Joint governing bodies have been established for the CDE programme management as shown below:

   - The *Project Management Board (PMB*) is responsible for the general management of the project and the programme. The PMB is composed of one representative of each Consortium Partner and Associated Partner. The PMB provides strategic advice to the Programme Board on the quality of the curriculum, the quality and composition of the Consortium, the quality of student projects, the Programme's activities and Programme administration, including budget allocation, planning and reporting.
   - The *Programme Board (PB)* is composed of six Programme Directors, two from each of the Consortium Partners, a Joint Programme Coordinator and one student representative with due authorisation to discuss, negotiate, and decide on actions proposed by the coordinating institution and the other members of the Consortium. PB members in each Partner Institution are responsible to ensure that the Degree Programme at their Partner Institution is consistent and in compliance with the joint agreements made by the parties regarding the Degree Programme.
     Moreover, the PB members are responsible and have the authority for all matters related to the curriculum, assessment and evaluation, student academic and logistic aspects, preparation and final approval of the annual plan of activities, quality assurance and degree awarding/recognition issues and any issue arising from students' feedbacks and complaints. During the interviews, the expert panel found that CDE Partner together with the Programme Board and in collaboration with the Advisory Council are committed to continuously working on improving and integrating outcomes from the EO4GEO project and related demand surveys into the joint curriculum.
   - The *Advisory Council* is composed of four external experts from academia and industry, as well as two CDE alumni with main responsibility to contribute to the design, delivery and quality assurance of the Programme. During the interviews the expert panel found that there is a strong dedication and commitment from the members of the Advisory Council in the programme.
   - The *Selection Committee (SelCom)* has the responsibility to manage the entire process until decisions about programme admission, specialization tracks and scholarship awards. The SelCom is composed of two members per Partner University, at least two members from Associated Industry Partners, and at least two members from Associated Higher Education Institutions. UPOL agreed to

coordinate the CDE Selection of Students, and chairing the Selection Committee, UBS nominates the co-chair. The SelCom manages the entire process until decisions about mobility scholarship awards.

- The *Administration Offices* are responsible for organizing the logistic items such as visa documents, arranging health and travel insurance coverage, assist with registration to courses etc. Each Consortium Partner selects at least one staff member who is responsible for implementing the administrative tasks within their respective university and advice students on logistical matters.
- The *Student Board (SB)* consists of active and alumni student representatives, two each. The SB represents all students enrolled and graduated in the CDE programme. The responsibilities of the SB are to represent students' rights and interests and to monitor whether these are taken into consideration; support and review the suggestions and decisions of the PB; nominate one or two members of the SB to the PB.

3. The expert panel found from the SER that ***financial organization*** is fully covered by the 'Financial Regulations/Participation Costs', 'Human and financial resources' and the' business plan' elements of the CDE Consortium Agreement. PLUS is the designated financial administrator, all financial matters are administered by PLUS, controlled by the Project Management Board and reported to Partners and the European Education and Culture Executive Agency (EACEA).
   In particular, financial aspects consist the following: management of scholarships, money flows between partners (participation costs), distribution of budget among the Partners, management of logistics and organizational expenses.
   The expert panel learned about the business plan of the programme as included in the SER as well about the sustainability of the programme during the interview with the Project Management Board & Programme Board members. The expert panel found a well justified business plan with a solid financial management plan that includes all the required details such as:

   - income (EMJMD Management grant, participation costs: partner country students, programme country students, Self-funded Partner country students, Self-funded Programme country students),
   - expenses (e.g. Organization of the EMJMD, programme management)
   - balance analysis (income and expenses)

   The expert panel during the interview suggested to the PMB of the CDE programme to develop a strategic plan for the programme that will include Key Performance Indicators (KPI's) with the main aim to help the monitoring of the sustainability issues.

4. The expert panel found from the SER that **the admission and selection procedures for students** are fully covered under the 'Eligibility Criteria for Selection to Admission', 'Student Selection and 'University Admission / Enrolment' elements of the CDE Consortium Agreement. The expert panel learned through the SER and during the interviews that the Consortium has well defined specific eligibility criteria for selection and admission such as:

   (1) Bachelor's Degree in a Geospatial Discipline or from an equivalent programme at an internationally recognized tertiary educational institution

   (2) Prior learning in Geoinformatics (includes Remote Sensing, Geo-statistics, Cartography, Surveying, Computer Science) and

(3) Programming/Software development experience, level of English, grades as documented in transcript of studies, motivation letter.

The expert panel verified during the virtual site visit that a well-defined selection procedure (e.g. eligibility check, initial filtering, final scoring, on-line interviews, nomination/acceptance) of students under the auspices of the Selection Committee is taken place. During the interview with students and Programme Directors, the expert panel retrieved that despite of the fact that the student selection is coming from a variety of the disciplines and background, the Consortium tries to bring all the selected students to the same level by making some small adjustments in the courses. The students expressed their satisfaction about the submission of the individual Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis during the Orientation Project, since it has been found a valuable tool for assessing their career prospects. Such SWOT analysis allows the Consortium to assess the current status of the students with the Copernicus disciplines and future developments (e.g. student's course selection adjustments, changes suggested by students or by insights resulting from classes, projects, internships, or summer schools etc.).

5. The expert panel found from the SER that that **the mobility of students and teachers** is fully covered and well explained under the 'Curricula, Study Path, Course Programme and Recognition' & 'Guest Lecturers and Invited Scholars' elements of the CDE Consortium Agreement. The expert panel concludes that the student mobility is well regulated in the curriculum. Indeed, the expert panel concludes that the mobility of teachers is well defined through the award of scholarships to invited scholars and/or guest lecturers for one to several weeks. PLUS serves as host university during semesters 1 and 2; UBS and UPOL during semester 3.
6. The expert panel found from the SER that **the examination regulations, student assessment methods, recognition of credits** are fully covered and well explained under the 'Course Recognition', 'Exams, Master's Thesis and Defence' elements of the CDE Consortium Agreement. Moreover, the expert panel found that the course and module examinations are organized under the responsibility and regulations of each CDE Partner University offering the course or module as described in the CDE curriculum and explained in the interviews. CDE programme is following the ECTS grading scheme published on the PLUS website. Indeed, the expert panel during the virtual site visit concluded that both the Consortium and the students are satisfied with this ECTS grading scheme since this provides the opportunity to the other two universities (partners) to convert local grades into a common grading scale, i.e. the one of PLUS. A single thesis is submitted in identical form at two partner institutions as a graduation requirement in order to comply with the award of the double degree of the programme.
7. The expert panel found from the SER that the ***degree awarding procedures*** in the Consortium are fully explained, well justified and covered by the 'Double Degree' and 'Exams, Master's Thesis and Defence' elements of the CDE Consortium Agreement. The student receives, upon successful completion of the study programme in accordance with the CDE curriculum a separate degree certificate from each of the participating institutions.

Recommendation

The expert panel suggests to the PMB of the CDE programme to develop a strategic plan for the programme that will include Key Performance Indicators (KPI's) with the main aim to help the monitoring of the sustainability issues.

4.2 Standard 2 Learning Outcomes (2.1 – 2.4)

Learning Outcomes
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).

Review Panel assessment: The standard is met

Statement
The CDE programme aims at building highly specialized knowledge in all the aspects related to geospatial data - acquisition, management, analysis, modelling, simulation and interactive communication. Graduates are prepared to face geospatial issues, provide geospatial contributions and develop geospatial applications in the different fields and application domains of the society where applicable. Examples are various - from urban planning to transportation management, disaster prevention and assessment, etc. - being Geoinformatics a methodology-oriented, cross-disciplinary subject based on spatial concepts and approaches. Particular attention of CDE programme is placed on Copernicus data and services, the understanding and use of which is not confined to a specific teaching, but which are considered as a basis for study and research throughout the whole course of the study.

On the basis of the curriculum of the CDE Joint Master's Degree programme and of the discussion about the learning outcomes during the site visit, the expert panel considers that the CDE corresponds to EQF level 7 and the same level applies for the national qualification frameworks.

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

Review Panel assessment: The standard is met

Statement
The knowledge acquired by CDE students is in the domain of Earth Observation (EO) and GeoInformatics:

- geospatial data acquisition and visual / cartographic communication;
- data modelling and spatial data management;
- EO and spatial data analytics;
- in-situ, remote and mobile sensing, Copernicus data and services included;
- spatial statistics; spatial decision support systems;
- standards for architectures of open and distributed systems and spatial data infrastructures;
- EO and geoinformatics applications.

Graduates of the CDE programme have the ability to work in the domain of geospatial data and services development as well as in application domains such as in spatial planning, regional management, mobility, environment and nature conservation.

Both when looking at the details of the modules in the CDE programme and when discussing with students and faculty members during the virtual site visit, the expert panel concludes that the CDE programme provides adequate information in the field of Earth Observation and Geoinformatics.
As an added element of interest, the content of the CDE programme is strongly rooted on the new EO*GI BoK (Body of Knowledge in the Geoinformation and Earth Observation field) established in the Erasmus+ Sector Skills Alliance project 'EO4GEO' - https://bok.eo4geo.eu/GIST), which can be considered as a reference for those involved in education at different levels (academician included).
Furthermore, PLUS and UBS are members of the Copernicus Academy Network. The network consists of universities, research institutes and business schools in Europe and aims to create a bridge between academic and research institutions with authorities and service providers, to facilitate collaboration in research in the field of Earth Observation. By stimulating the organization of conferences, training sessions, internships, as well as educational and training materials it aims to enable the next generation of researchers, scientists and entrepreneurs to master the Copernicus data and information services to their fullest potential. The expert panel believes that the participation in the network, with the comparison and collaboration with the other members, helps to build a programme adhering to the evolution in the field of Earth Observation and Geoinformatics.
Before the virtual site visit, the impression of the expert panel was that some topics, such as DIASs (Data and Information Acces Services) or Copernicus services, are not addressed thoroughly enough. However, this concern was dispelled by discussions with teachers and students. Both explained how newer aspects in the EO and GI field are part of the practice and lab, the Summer School and the thesis.
Based on these considerations, the expert panel was satisfied with respect to the fulfilment of this standard.

Learning Outcomes

2.3 Achievement [ESG 1.2]:

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

Review Panel assessment: The standard is met

Statement
Aim and objectives of the joint programme are clearly defined. The programme aims at building advanced competences in geospatial data acquisition and data management, data analytics and simulation as well as interactive communication. Graduates of the CDE joint master programme are educated and trained to lead initiatives and projects that take advantage of Copernicus data and services (remote sensing and in-situ) and translate these data into information for management decisions within a broader Digital Earth vision.
Students attend courses on Earth Observation and Geoinformatics in the first academic year at the University of Salzburg (PLUS). Then they have two specialization tracks in big earth data / image analytics and machine learning at the University of South Brittany (UBS) or in geovisualization and geocommunication at the Olomouc University (UPOL) in the second year of studies. Moreover, students complete obligatory internships outside the university and this increases their exposure to concrete problems of a geoinformatic nature from different points of view other than those presented in university courses.
The programme is based on the Copernicus Academy Network objectives and the available Body-of-Knowledge in the field. PLUS contributes to both of these initiatives.

Besides the professional and scientific skills, students have the possibility to study abroad and this is relevant not only for their personal growth in terms of open-mindedness, but it is also beneficial for their employability and future career in the private sector and in research.

The Partner Universities use Learning Management Systems (LMS), which not only have become fundamental in the Covid time for achieving the intended learning outcomes, but also contribute to the enhancement of students' digital performance and competences. Students will be predisposed to the idea of exploiting similar tools also for practices in Lifelong Learning and continuing professional development across boundaries.
The Master theses are co-supervised by faculty from at least two different partner universities, and/or mobility partner. This means other academic partners, enriching the possibility of developing the thesis with the best possible guidance, can host students also.
Beside the analysis of the documents provided to the expert panel and the virtual site visit, the analysis of the added material requested by the Consortium and specifically the following information on the publically available CDE joint master's programme website https://www.master-cde.eu/, provided impressive evidence of the achievements of CDE students and graduates:

- the students' e-portfolios and of the wealth of projects involving them (https://www.master-cde.eu/student-life/students-alumni/)
- the Master Theses (https://www.master-cde.eu/programme/theses/)
- the student awards (https://www.master-cde.eu/programme/awards/)
- the student scientific publications (https://www.master-cde.eu/programme/scientific-publications/)
- the students – other publications (https://www.master-cde.eu/programme/poster-presentations/)

Thus confirmed to the expert panel that the intended learning outcomes are achieved.

Learning Outcomes
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.

Section not applicable

4.3 Standard 3 Study Programmes (3.1 – 3.3)

Study Programmes (ESG 1.2)
3.1 Curriculum: The structure and content of the curriculum should be fit to enable the students to achieve the intended learning outcomes.

Review Panel assessment: The standard is met.

Statement
The expert panel found in the SER and during the virtual site visit, that the curriculum is fit to enable the students to achieve the intended learning outcomes. In terms of structure, the curriculum is very clear and concise as shown in Figure 1.

Fig.1 CDE curriculum/programme structure[1]

It starts with the Orientation Project followed by a set of modules offered by PLUS in the first year. Usually, done between year 1 and year 2, there is an international Summer School (SS) foreseen. This SS can be one offered by the CDE partnership, but in addition, other SS opportunities worldwide can be used.
The second year is completed either at UBS, with the specialization track GeoData Science, or at UPOL with the specialization track Geovisualization/Geocommunication. The set of elective subjects allows for some flexibility. The mandatory internship allows the students to get in contact with businesses and potential future employers. It can be done full-time outside the course periods or part-time during semesters. During the virtual site visit and the discussions with students and alumnae, the internship was considered to be of high value for the students and their development. The Consortium has already gained new associated partners in the course of the project and is considering adding new partnerships. The content of the curriculum is broad enough to cover the spectrum of geoinformation science and technology, as there are

[1] https://www.master-cde.eu/programme/curriculum/

courses in all important fields (remote sensing, GIS, cartography, informatics, spatial analysis, modelling, spatial data infrastructures). Based on this spectrum, the intention to educate students to become GIScientists can be achieved. Reviewing the study programme shown in Fig. 1, the expert panel considers the curriculum very packed. The total number of ECTS-credits is appropriate, although at the upper limit (max. 120 ECTS-credits). In addition, the students have to learn new languages, have many organizational efforts moving to two different locations (as many of the students come from neither of the partner HEIs) and have to adapt to a new culture in addition to their course work. The expert panel therefore emphasizes, that the workload of the individual courses have to remain clearly in the pre-defined limits in terms of ECTS/workload in order to ensure a doable programme.

For the second intention, to 'extend from management to leadership', CDE can certainly offer the basis. The expert panel saw during the site visit, that alumni actually took steps to go into leadership domains. However, the expert panel also found, that soft skills like project management, presentation or leadership skills are only indirectly gained through the organisation of thematic courses, as is mentioned in the supplementary material, that "*students thereby develop time and project management, and are especially exposed to group and team work. Further soft skills include course presentations, participation in conferences, application developments and contest participation and the compulsory internship. Summer schools participation also enhance soft skills, such as interpersonal skills, planning and organizing an initiative, team work, dependability and reliability, as well as working in an international/cultural environment.*" Further, the personal SWOT analysis was mentioned in the site visit. The expert panel agrees with the students, that this is a very helpful tool to assess not only the thematic competences, but also needed soft skills. The expert panel recognized all these efforts as very valuable additional education in the frame of CDE. Due to the already very packed curriculum, there are no specific courses to develop soft skills, which is justifiable.

In terms of thematic content, it should be noted, that based on the written material only, the expert panel was concerned to find insufficient remote sensing lectures and insufficient Copernicus content in the curriculum. During the site visit, the content of individual courses in the curriculum could be sufficiently clarified to convince the expert panel, that the required remote sensing competences are actually part of the curriculum. It was mentioned, that remote sensing has been a strong focus in the Summer Schools offered so far and are also part of several other courses, e.g. in Big Earth Data.
In terms of Copernicus topics, the expert panel found that these were also insufficiently explained in the SER, but similarly, the Consortium could clearly explain the numerous links between the CDE programme and the Copernicus monitoring system. It was noted, that marine and atmospheric Copernicus services are not a focus in the Consortium. This fact does not pose a problem, nor does it decrease the overall merit of the programme, but it should be clearly documented. Further, the review of the study programme revealed a lack of recommended textbooks for the courses.

Through the involvement of the Consortium in the EO4GEO project, the Consortium is in a very good position to adjust and update the curriculum with regard to upcoming user needs and new trends in the field. Current trends like Digital Twins are not specifically mentioned in the SER, because the SER was already written in 2020, when this concept of Digital Twins was not so popular. However, the Consortium could convincingly explain, how new trends are taken up in the course content. The close connection with research projects and related "research-based teaching" is ensured through teachers, who are actively involved in research projects. The CVs of the main faculty members in all three HEIs provide evidence to this fact.

Recommendation

The expert panels recommends improving the wording in the curriculum to show the content of the curriculum more transparently. This refers specifically to i) remote sensing lectures; ii) Copernicus topics and iii) leadership education.

- It should be mentioned, as explained during the site visit, that e.g. remote sensing lectures are a strong focus in the Summer Schools.
- In terms of Copernicus services, the expert panel recommends refining the wording in the module description (module content) to reflect the focus on those services, which are mainly covered (land, disaster, etc). Also the apparent close cooperation with research projects could be emphasized.
- Regarding the aim to build leadership competences, the expert panel also recommends a clearer re-wording to manage students expectations. Students might expect more specific courses in this frame based on the current presentation.

The expert panel suggests also revising the existing module content (module descriptions) in the curriculum with some suggested textbooks & references.

The internship is often - though not solely - offered by associated partners. The expert panel recommends using the option of new partnerships to offer the students a wider range of possibilities to perform the internship.

Study Programmes (ESG 1.2)
3.2 Credits: The European Credit Transfer System (ECTS) should be applied properly and the distribution of credits should be clear.

Review Panel assessment: The standard is met.

Statement

The CDE programme applies the European Credit Transfer and Accumulation System (ECTS). The distribution of credits is clearly described. The CDE curriculum consists of modules with a base of 6 ECTS-credits, making a total of 30 ECTS-credits per semester. All three partners in the Consortium apply the same system and calculate with the same workload per ECTS-credit. According to the SER, one credit point corresponds to 25 hours of study and estimates the average number of hours required to achieve the intended learning outcome. The two specialization tracks at UBS and UPOL also have an equal number of 24 ECTS-credits and the tracks can therefore be considered to be comparable in terms of workload.
The ECTS-credits for Summer Schools (6 ECTS-credits) are not fully transparent, as there are no clear rules on the transferability/comparability between different Summer Schools. Due to the fact, that most students so far attended a Summer School at one of the partner institutions, this was not too critical. However, since the selection of the summer school is open to students, there should be a system in place to allow transferability. This means that for the assessment of comparability of a Summer School, the calculation of the workload of Summer Schools should be defined and clearly reflect the earned 6 ECTS-credits. The expert panel generally welcomes the openness to allow also other SS, but the efforts should be clearly defined and comparable.

Recommendation

The expert panel recommends that for the Summer Schools, there should be a specific guideline on what properties a Summer School should have to be eligible (how many days, thematic focus, eligible host institutions) etc. Alternatively, the Consortium can also limit the eligible Summer Schools to their own offers, but the first option is to be preferred.

Study Programmes (ESG 1.2)
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.

Review Panel assessment: The standard is met.

Statement

Generally, the CDE programme is well specified and explained. The expert panel however noticed a very heavy workload on the students, specifically in the second year. As explained under Section 3.1, the workload is on the upper limit (120 ECTS-credits in the range of min. 90 to max. 120 ECTS-credits), when compared to alternative master programmes, which do not even include the here required mobility, which adds to the workload due to language, organizational and cultural differences.

Apparently, the workload was manageable, as was shown by the successful completion of the programme by the first intake in time. There are several reasons for this success: firstly, the very good support by the programme office and the Consortium, secondly, the rigorous selection process leading to an intake of exceptionally motivated and capable students and thirdly, the financial support allowing the students to focus solely on their education.

Recommendation

The expert panel recognizes the extremely good support coupled with very high workload. The expert panel suggests closely monitor the calculated workload in close cooperation with students on the one side and in a coordinated manner between the Consortium partners on the other. Such a monitoring system helps to ensure the intended and currently existing equal level of ECTS-credits in the different partner institutions.

As a further recommendation, the option to couple the internship thematically with the master thesis topic should be supported and actively encouraged, both towards the students and towards associated partners who acts as internship providers. Such a coupling can reduce the workload on the one hand and would benefit the quality of the master thesis on the other. The latter is due to the fact, that a coupled master thesis has to follow the requirements set in the internship institutions (practical need for the research done, topic close to real project needs) as well as the high standards required by the CDE programme (scientifically demanding, beyond state-of-the-art).

4.4 Standard 4 Admission and Recognition (4.1 – 4.2)

Admission and Recognition (ESG 1.4)
4.1 Admission: The admission requirements and selection procedures should be appropriate in light of the programme's level and discipline.

Review Panel assessment: The standard is met.

Statement

As stated clearly on the CDE programme website, https://www.master-cde.eu/ and in the SER, the admission is straightforward and transparent. Students interested in the programme have to register.

There are general eligibility criteria, such as students must hold a bachelor's degree in a geospatial discipline or from an equivalent programme at an internationally recognised tertiary educational institution.
Within the programme specific eligibility, students have to prove sufficient basic knowledge in the field of geospatial expertise. Under the term "geospatial expertise", are considered all the closely related fields of geoinformatics, digital geospatial technologies, geomatics, remote sensing, geographic information system science, geoscience, geodata science, digital cartography, etc. Further, the admission can be granted to applicants, who can prove their ability in the above-mentioned fields either from a related degree programme or from practical applications or work experience, respectively.
Further, applicants must demonstrate proficiency in English language by submitting standardized English/instruction language test scores, or a certificate confirming completion of studies (at least four-semesters) in English language at a recognized post-secondary educational institution.
Applicants are selected by the Selection Committee, which manages the entire selection process. It ranks applicants according to five categories: Outstanding, Highly competent, Competent, Not yet competent, and Failed.
Admission to the programme will be offered to outstanding applicants considering balanced distribution between the specialization tracks (UPOL and UBS) and according to gender. Applicants with outstanding evaluations are then ranked by their performance in an online interview, where the Selection Committee validates the submitted documentation with regard to language skills and assesses personality and potential.
The issue of insufficient outstanding applications was raised during the virtual site visit by the expert panel. The Consortium showed with high numbers of applicants and many exceptionally good students, that this has not been the case so far. Although this might not be an issue now, it does not preclude it from happening in the future.

Recommendation
Although under the current circumstances not needed, the expert panel recommends the Consortium specify the steps taken, if insufficient outstanding applications are received, e.g. to allow also applications rated as "highly competent" or to simply reduce the number of students for this specific intake. This will allow the programme to run smoothly and make the selection procedure transparent under different scenarios.

Admission and Recognition (ESG 1.4)
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.

Review Panel assessment: The standard is met.

Statement
Appropriate recognition procedures are in place and are in line with the Lisbon Recognition Convention's principles. A total number of 120 ECTS-credits is required for graduation. There are well-defined criteria for the completion of the Thesis.

UPOL and UBS offer CDE's specialization track courses as modules of their Master' study programmes, they mutually recognize courses according to the joint CDE curriculum. The SER

and the Consortium Agreement also stipulate that the CDE's PB is responsible for decisions on questions of recognition and degree awarding.

The Partner universities award (double) academic degrees to all CDE students and also issue a joint Consortium degree certificate, and all graduates receive a Diploma Supplement. The Consortium strives to further develop the applied double degree awarding system into a fully recognized joint degree awarding system.

4.5 Standard 5 Learning, Teaching and Assessment 5.1 – 5.2)

Learning, Teaching and Assessment (ESG 1.3)
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.

Review Panel assessment: The standard is met.

Statement

The Consortium has already put a lot of efforts into coherent learning and teaching approaches in order to achieve the intended learning outcomes of the programme.

Learning and teaching approaches consists among others the following:

- Joint team teaching, the use of MOOC (massive open online course), flipped classroom, blended learning, or even adaptive learning.
- Each partner university provides educational content via its own Learning Management System (LMS). Additional supporting materials for joint courses at all partners are consolidated on one LMS of the programme.
- Courses are designed to provide the opportunity to the students to start from problem analyses working towards solutions or decision support.
- There is strong mentoring and student support from the faculty staff.
- Participation of students in research projects through mixed teams

The expert panel concludes, based on the written information received and the interview with representatives of the study programme development and lecturers in the Consortium, the following:

- The programme provides the required skills and background so as the graduates are able to work in Copernicus related sectors or industry. Indeed, this is achieved through the well academic coordination from the Consortium, successful skills development through the curriculum, body of knowledge provided, compliance with the' EO4GEO' project's skills and needs analysis.
- Smooth transition into 'year two' environment is achieved, through 'year one' courses, in which contributions across partners (partly via teleconferencing) is taken place.
- The mandatory use of e-portfolio is an ideal option to bundle the learning outcomes. The expert panel considered this approach as a successful learning and teaching approach. It makes students work visible to a wide audience and most students are motivated to aim for excellent results and quality presentation.
- Good interaction of the students with each other in the 1st semester of the programme and through the election of the student board.
- Exams are found adequately to test the required skills in the module descriptions.
- Students develop time and project management skills, and are especially exposed to group and team work.

- Summer Schools participation enhance soft skills, such as interpersonal skills, planning and organizing an initiative, team work, dependability and reliability, as well as working in an international/cultural environment.
- Synergies between research and teaching is fully explored, especially in the second year of the programme, during the internship and the Master's thesis
- Team teaching, blended learning environments, internship placements, group work and conference enhance transferable skills to the students.
- Student support and advice services at each partner university are well established.

During the virtual meeting with the expert panel, the graduates expressed the following suggestions that came up during the pandemic period for further considerations: to incorporate more hands-on practical assignments in the curriculum modules than it was possible during the pandemic. Such as exercises and experiments with in-situ measurement devices (eg. use of Unmanned Aerial Vehicle UAVs, spectroradiometer, thermal sensors, etc.) which the Consortium said have resumed as far as Covid regulations allow.

Based on the above findings, the expert concludes that this standard is met.

Recommendation
The expert panel suggests to the Consortium to incorporate more hands-on practical assignments in some of the curriculum modules than it was possible during the pandemic period.

Learning, Teaching and Assessment (ESG 1.3)
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.

Review Panel assessment: The standard is met.

Statement
The expert panel found the following regarding the student learning outcomes assessment and examination regulations both from the SER and from the interviews:

- All institutions hosting exams apply their national general grading system for course examination.
- Students receive basic information on course type, workload and assessment in the curriculum, in PLUSonline (course and study management system provided by PLUS) and in detail at the beginning of each course
- Student selection and grading are well regulated. A common grading system based on the ECTS grading table and including conversion rules, is established by the Consortium and made available to the students at the beginning of their studies.
- Joint examination regulations are very beneficial for the programme.
- The master's programme will be completed with a master's exam (thesis defence) before an examination committee.

The expert panel found during the interviews with the students that assessment of student learning outcomes is further achieved through the following key points in which the students are fully satisfied:

- consistent assessment from all partners,
- contributions across partners in the majority of the courses in particular for year 1,
- participation of students in research projects through mixed teams and

- co-supervision of the master's thesis.

Based on the above findings, the expert panel concludes that this standard is met.

4.6 Standard 6 Student Support

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.

Review Panel assessment: The standard is met.

Statement
The CDE Consortium clearly lays responsibility for all matters regarding student support and achievement of the desired learning outcomes with the CDE Programme Board (PB).
During the orientation project, students receive individual mentoring and recommendations for elective courses based on their academic background, which helps bringing the student cohort on the same level. The programme committee provides support material such as handbooks on the specifics of the three institutions to the students through their website, https://www.master-cde.eu/.
Furthermore, the administration offices act as primary contact to the students for all concerns, and redirect them to other support facilities if necessary. In particular, the administration officers also provide support in finding student housing or filing registration documents with government agencies. Especially the very helpful programme office as a one-stop-shop for all potential issues in relation to both studying and mobility is highly valued by the students.
It is the impression of the expert panel that the students in this programme feel valued and well supported in all three institutions. Faculty explicitly support them by providing a platform for networking across semesters and locations, and in forming a Student Board which nominates members to the various committees of the programme administration. So far, based on discussions between faculty and students, smaller adjustments of the programme have been made on the course level. In preparation of the re-application for the Erasmus Mundus programme, the PB intends to make some larger changes requiring committee action.

The expert panel recognizes that all involved administration and teaching staff are very motivated and supportive of student needs. Given that the programme language is English, all programme related offices have experience with supporting international students.

The expert panel concludes that standard 6 Student support is met.

4.7 Standard 7 Resources (7.1 – 7.2)

Resources (ESG 1.5 & 1.6)
7.1 Staff: The staff should be sufficient and adequate (qualifications, professional and international experience) to implement the study programme.

Review Panel assessment: The standard is met

Statement
Each Partner University has a high number of teaching faculty members (PLUS:12, UBS:12, UPOL:7) and some guest lecturers (PLUS:2, UBS:1, UPOL:1). The number of faculty

members is evaluated as adequate by the expert panel considering that the number of students in the three years of intakes was 12, 15 and 19[2].
Besides teaching, at each Partner University there is a structure of faculty/staff involved in the activities/management of the master: Project Coordinator (PLUS:1, UBS:1, UPOL:1), Project Coordinator Assistant (PLUS:1, UBS:1, UPOL:1), Programme Board (PLUS:3, UBS:2, UPOL:2), Programme Office (PLUS:3, UBS:1, UPOL:1), Technical Staff (PLUS:1, UBS:2, UPOL:1). Altogether the faculty/staff is considered adequate by the expert panel.

Based on the self-evaluation report and also on the added material requested by the expert panel from the Consortium during this assessment and related to the excellence in research (recent key publications, recent funded projects and recent information on H-indices), the expert panel concludes that the CDE faculty is scientifically qualified and keen in translating their research into teaching.
Referring to the disciplinary field, PLUS is involved in the creation of a new Earth Observation and Geographic Information Body of Knowledge, which is recognised by the global scientific community as a reference in terms of geospatial knowledge areas and concepts. This is considered by the expert panel as an added proof of the capacity of the staff to implement the study programme adequately.

Guest lecturers and invited scholars are selected based on their academic excellence, pedagogical value for the courses and contribution to diversity. Applications are submitted directly to the Programme Office and published on the programme's website. Scholars/guest lecturers are selected by the Selection Committee and the Programme Board members of the Master. The procedure is evaluated as adequate by the expert panel.

Resources (ESG 1.5 & 1.6)
7.2 Facilities: The facilities provided should be sufficient and adequate in view of the intended learning outcomes.

Review Panel assessment: The standard is met

Statement
Besides the presentation of the specific facilities available to students (dedicated lecture rooms equipped with conference tools for distance teaching, fully equipped computer labs for students, a high-performance computing lab shared between CDE students and the hosting research group in UBS, EO*GI expert labs with multi-core, GPU equipped machines) the expert panel was provided with short videos and web pages URL presenting the key facilities/infrastructures of the three universities.

Moreover, during the virtual site visit the expert panel was able to verify, discussing both with faculty and students, that in the last two years university spaces have remained open to students, obviously following the COVID regulations, and this was appreciated as students reported, because they like to connect in person. Students have the possibility of using computing resources and equipment for their courses and research work. They can also access software through VPN and they have the support of department technicians if necessary.
The expert panel concludes that the three universities provide adequate facilities and infrastructure for teaching and learning purposes.

[2] https://www.master-cde.eu/student-life/students-alumni/

4.8 Standard 8 Transparency and Documentation

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.

Review Panel assessment: The standard is met.

Statement

All relevant information is published and available online on the CDE´s website https://www.master-cde.eu/. The admission requirements and procedures are detailed and transparently published under https://www.master-cde.eu/admission/.

All information is online and available to mobile students as well as those present on-site. The programme office at PLUS serves as the in-situ information source "one-stop-shop" analogue to the digital website with all necessary information collected and transparently made available. The course catalogue is given separately for each Partner University. This does not pose a problem, as the first year is done at PLUS, while the second year is done either at UPOL or at UBS. All the courses are nonetheless listed on the website, https://www.master-cde.eu/programme-courses/.

The transparency of evaluation procedures is currently weak. The expert panel learned during the site visit, that so far, course evaluations were only collected in German, which is problematic for many international students. However, there is already a revision of the evaluation system currently in progress, which will allow English evaluations in the near future. The expert panel further learned that the evaluation outcomes are usually not fed back to the students in any formal and transparent way. The expert panel however recognised the good partnership between teaching staff and students facilitating direct exchange on any potentially upcoming issues.

Recommendation

The expert panel recommends progressing with utmost efforts to enable course evaluations in English language.

The expert panel further recommends to establish a transparent feedback system so that students can see that their evaluations are considered, e.g. in updates of the programme.

4.9 Standard 9 Quality Assurance

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.

Review Panel assessment: The standard is met

Statement

In the Copernicus Master in Digital Earth, quality assurance is conducted on the module level by each participating institution. The Programme Board is responsible for QA of the entire programme, and the local coordinators evaluate the reports they receive from the respective universities in collaboration with the teaching staff and student representatives appointed by the CDE Student Board. In some cases, teachers additionally discuss the surveys with the

students in their courses. It is up to the Programme Board to identify and implement appropriate measures in order to improve the programme. According to members of the Programme Board, no specific procedures have been formalized so far. The expert panel has been made aware that for some time, the forms for the course evaluation had only been available in German at PLUS. The panel further learned that the students in some cases do not know what happens with the results, which led to low participation rates in the surveys.

The programme Advisory Council regularly enters discussions with the Programme Board regarding new technologies that should be included in the programme in the event of a revision of the curriculum, which is planned during the funding re-application to the Erasmus Mundus programme. These discussions are often of an informal nature and sometimes only include individual members of both governing bodies.

It is the perception of the expert panel that the evaluations of individual modules take place regularly in line with the procedures at each institution and quality assurance at the module level is hereby sufficiently implemented. However, since no formal procedures for internal QA on the programme level were evident, the panel remains concerned. The differences between the QA systems of the three institutions which need to be bridged in order to evaluate the entire programme may warrant a more formal approach. Furthermore, this increases the transparency of the QA approach towards students and other stakeholders.
The expert panel appreciates the efforts taken by faculty members in order to make their courses accessible for students with a wide range of academic backgrounds, and to rejuvenate the programme by including new technology as it becomes relevant to the professional field.

Recommendation
The expert panel recommends that the programme board formalizes its approach to QA on the programme level and publishes the process in a suitable and transparent way (see also recommendation Standard 8).

5 Summary and final assessment

All sessions in the agenda of the virtual site visit included a constructive discussion with all attendees and the input collected along with the SER documents have been used by the expert panel to complete this report. The expert panel has found the SER materials to be extensive, well-documented and very comprehensive. Overall, the programme's objectives are achieved as the learning outcomes address the potential of the graduates from this joint master programme. The expert panel experienced a Consortium highly spirited and committed to their mission. The expert panel concludes that all standards are met.
The expert panel concludes that the programme has demonstrated its adoption and compliance with a series of good practices during the virtual site visit and through the SER documents provided. These practices include:
The study programme

- allows students to develop a strong theoretical and practical background in the multidisciplinary nature of the discipline,
- promotes a global perspective in the fields of Geoinformatics (GI) and Earth Observation (EO) resulting in well-qualified graduates that industry and academia, both nationally and internationally, seek out for hiring, and

The faculty

- are enthusiastic, hardworking, and dedicated to the teaching values and duties and take pride in their efforts to provide students with a first-class education,
- are active in research and in pursuing external competitive funding,
- are open to continuous improvements in the curriculum based on feedback, and remain committed to being aligned with research, industry and societal needs,
- are open to collaborate with the Advisory Council and Student Board,
- recognize the value of a sustained relationship with students and alumni by promoting an open environment for interaction and communication across the programme's constituency groups

Final Assessment
The review panel recommends the accreditation of the Joint programme "Copernicus Master in Digital Earth" without conditions.

6 Annex: Documents to support the review report

- Self-evaluation report: Copernicus Master in Digital Earth, November 2020 submitted March, 2021
- Information on the respective national legal framework that allow the Consortium Partners to participate in the joint program and, if applicable, to award a joint degree, submitted 20th January 2022
- List of recent key publications, recent funded projects and recent information on H-indices, Scopus indices for key staff, submitted 25th January, 2022
- Short videos on the key facilities/infrastructures (laboratories, etc.) relevant and necessary for the implementation of the joint program, 25th January, 2022

  PLUS
  - Department of Geoinformatic: https://youtu.be/VrZZF3dofOI, last access 16th March, 2022
  - Most courses are held at location #3 – Techno-Z @ScienceCitySalzburg, see locations relevant for Geoinformatics students @Z_GIS further information https://www.master-cde.eu/student-life/salzburg/, last access 16th March, 2022
  - GI Lab & Lecture, library, study room, IDEAS lab: https://www.master-cde.eu/student-life/salzburg/salzburg-plus-facilities/, last access 17th March, 2022

  UPOL
  - Video tour from our department: https://www.youtube.com/watch?v=UFA1uCM1jKk, last access 17/03/2022
  - Video tour from our faculty: https://www.youtube.com/watch?v=GwlybCRKG2U, last access 17/03/2022
  - Maps of all buildings and facilities of UPOL with virtual tours: https://mapy.upol.cz/en/, last access 17th March, 2022
  - https://www.master-cde.eu/student-life/olomouc/, last access 16th March, 2022

  UBS
  - University: https://youtu.be/JfzWeys5Nvw, last access 16th March, 2022
  - https://www.master-cde.eu/student-life/vannes/ Copernicus Master in Digital Earth Master classes take place at the FACULTY OF SCIENCE AND ENGINEERING, Rue André Lwoff, 56017 VANNES Cedex, last access 16th March, 2022
- General statistical information of the joint program, such as actual student numbers (intake), student progress reports, graduate survey, submitted 26th January, 2022
  - Students intake dashboard: https://www.master-cde.eu/student-life/students-alumni/ , last access 16th March, 2022
  - Application statistics – intakes 1-3: https://www.master-cde.eu/admission/procedures-deadlines/calls/application-statistics/, last access 16th March, 2022
  - (dashboard/map) Links to individual e-Portfolios: https://www.master-cde.eu/student-life/students-alumni/ , last access 17th March, 2022
  - Master Theses: https://www.master-cde.eu/programme/theses/, last access 16th March, 2022
  - Student awards: https://www.master-cde.eu/programme/awards/, last access 16th March, 2022
  - Student scientific publications: https://www.master-cde.eu/programme/scientific-publications/ , last access 16th March, 2022

- Students – other publications: https://www.master-cde.eu/programme/poster-presentations/ , last access 16th March, 2022
- Example: CDE Alumni job profiles, January 2022 (xls)
- Example: SWOT summary intake 1 and intake 3 (pdf)
- Example: UBS feedback semester 1 (pdf)
- Example: Intake 1 feedback meeting (pdf)

- Results from module evaluations (evaluations of two to three modules with different course types), results from workload evaluations or other information or data explaining ECTS-credits allocation, submitted 26th January, 2022
  - Example 1-3: Evaluierungsergebnis – PLUSonline-Universität Salzburg
  - ECTS-credits allocation: Qualitätshandbuch für Lehrende der Universität Salzburg: https://www.plus.ac.at/wp-content/uploads/2021/04/Handbuch-Lehrende-v06112020.pdf, last access 16th March, 2022
  - Module/Course evaluations - attachments and overview of course types: https://www.master-cde.eu/study/course-types-exams/, last access 16th March, 2022
- Information in relation to competences profile of the graduates, submitted 1st February, 2022
  - References to soft skills in the context of internships: https://www.master-cde.eu/programme/curriculum/, last access 16th March, 2022
  - Enhancement of soft skills: https://www.master-cde.eu/networking-join-linkedin-group-for-students/, last access 16th March, 2022
  - Presentation: CDE soft skills model (pptx)
  - CDE competency matrix (xls)
  - EO4GEO BoK: https://bok.eo4geo.eu/CV, last access 16th March, 2022
  - Geospatial Technology Competency Model: https://www.careeronestop.org/competencymodel/competency-models/geospatial-technology.aspx, last access 16th March, 2022
- Written explanation in relation to Standard 1.1 regarding Accreditation in France , submitted 21st February, 2022
  - http://ehea.info/page-france, last access 17/03/2022
  - https://www.legifrance.gouv.fr/loda/id/JORFTEXT000028543525/2022-02-08/, last access 16th March, 2022

7 Annex: Glossary

Body-of Knowledge (BoK)	Documentation of the Geographic Information Science domain, its key knowledge areas and associated technologies (GIS&T); (https://gistbok.ucgis.org/), last access, 17th March, 2022 recently expanded by the EO domain in the EO*GI BoK of EO4GEO (http://www.eo4geo.eu/bok/, last access,17th March,2022)
CDE	Copernicus Master in Digital Earth (www.master-cde.eu funded EMJMD programme under the framework of Erasmus+)
EACEA	Education, Audiovisual and Culture Executive Agency (https://eacea.ec.europa.eu/)
ECTS	European Credit Transfer and Accumulation System
EHEA	European Higher Education Area
EMJMD	Erasmus Mundus Joint Master Degrees
EO	Earth Observation
EO4GEO	Erasmus+ Skills Alliance project that aims to help bridging the skills gap between supply and demand of education and training in the EO/GI sector http://www.eo4geo.eu
ERASMUS+	ERASMUS+ is the EU's programme to support education, training, youth and sport in Europe (https://ec.europa.eu/programmes/erasmus-plus/)
ESG	Standards and Guidelines for Quality Assurance in the European Higher Education Area
GeoDSc	GeoData Science specialization track at UBS
GeoVIS	GeoVisualization and Geocommunication specialization track at UPOL
GI	Geographic Information
GIS	Geoinformationssystem
HEI	Higher Education Institution
KPI	Key-Performance-Indicator
LMS	Learning Management Systems
PB	Programme Board
PLUS	Paris-Lodron Universität Salzburg (Paris-Lodron University Salzburg), Austria
PLUSonline	Course and study management system provided by PLUS
PMB	Project Management Board
SB	Student Board
SelCom	Selection Committee
SER	Self-evaluation report
SS	Summer School
SWOT analysis	Strength, Weaknesses, Opportunities, Threats analysis
UAV	Unmanned Aerial Vehicle
UBS	Universite de Bretagne Sud (University of South Brittany), France
UPOL	Univerzita Palackého v Olomouci (Palacký University Olomouc), Czech Republic
VPN	Virtual Private Network