Agentur für Qualitätssicherung und Akkreditierung Austria

Summary report – Joint Master's Programme "Copernicus Master in Digital Earth" (CDE)

A Consortium of cooperating Universities, led by the University of Salzburg, requested AQ Austria to conduct an external quality assurance of its Joint Degree Master's Programme "Copernicus Master in Digital Earth" (CDE) in English, carrying 120 ECTS. The Consortium of CDE has decided with regard to external quality assurance to follow the *European Approach for Quality Assurance for Joint Programmes* (European Approach, short: EA) that has been approved by European Higher Education ministers in May 2015 in Yerevan. According to the EA cooperating institutions can select a suitable quality assurance agency from the list of EQAR-registered ones. AQ Austria is an EQAR-registered agency. 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)*.

1 Accreditation decision

At its 73th meeting on 20th May 2022, the Board of AQ Austria decided to grant accreditation without conditions for a period of six years to the

Erasmus Mundus Joint Master's Programme "Copernicus Master in Digital Earth"

The accreditation of the Joint Programme is valid until 19th March 2028. The Joint Programme is implemented at the hereinafter named Universities of the Consortium.

- University of Salzburg (PLUS), Austria
- University of South Brittany (UBS), France
- Palacký University Olomouc (UPOL), Czech Republic

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2 Short information on the accreditation procedure

The Consortium led by the lead partner University Salzburg, submitted an application for accreditation of the study programme in March 2021. Based on a circular resolution on 3rd November 2021, the Board of AQ Austria passed the proposal for the members of the four-member expert panel for the review and assessment of the Joint Programme. The members of the expert panel were:

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

A virtual site visit took place on 8th February 2022, which was conducted by the expert panel and project-representatives from AQ Austria. The Board of AQ Austria took the accreditation decision without conditions in its 73th meeting on 20th May 2022.

3 Subject matter of the application

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

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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

3.1 Profile of the Study programme

Excerpt from the Self-Evaluation Report p. 8-9:
"The European "**Copernicus Master in Digital Earth**", a two year full-time integrated **Erasmus Mundus Joint Master Degree** programme, aims at qualifying individuals to lead initiatives, projects and institutions translating Copernicus data (remote sensing and in-situ) into information for management decisions within a broader Digital Earth vision.

Digital Earth is a concept well established since 1998, focusing on the interaction between humans and virtual representations of our world from local to global scales. More recently, this concept has gained traction as a framework for leveraging geospatial technologies for better management of our societies, environments and economies. Quoting the 2009 Beijing Digital Earth declaration: *"Digital Earth is an integral part of advanced technologies including: earth observation, geo-information systems, global positioning systems, communication networks, sensor webs, electromagnetic identifiers, virtual reality, grid computation, etc. It is seen as a global strategic contributor to scientific and technological developments, and will be a catalyst in finding solutions to international scientific and societal issues."*

The EU Earth Observation programme Copernicus offers information services based on satellite and in situ acquired geospatial data. Open data access has greatly enhanced the potential for realizing a range of societal benefits. The Joint Master programme addresses the associated capacity building needs on a graduate level. From the above quoted document "Digital Earth" plays a strategic and sustainable role in addressing challenges to human society as natural resource depletion, food and water insecurity, energy shortages, environmental degradation, natural disasters response, population explosion, and, in particular, global climate change" it is made clear that a European qualification in this field will have to address key themes like Atmosphere and Climate, Marine and Land Environments, Security and Emergency Management.

The **University of Salzburg** is building on its established 30 year record of educating, experts for a spatial view', and is joining forces with partners complementing its geospatial methodology foundations with key specialization components.
Olomouc University's leadership in geo-visualization and geo-communication, and **University of South Brittany** alternatively emphasizing methods in big earth data / image analytics and machine learning. Jointly, these tracks offer outstanding candidates a pathway towards excellence in advanced Geoinformatics addressing the Copernicus and Digital Earth missions and objectives.
Students study Earth Observation and Geoinformatics in the first academic year. The two specialization racks offer outstanding candidates a pathway towards excellence in GeoData Science (GeoDSc) as well as GeoVisualization (GeoVis) and Geocommunication in the second

year of studies. The Geographic Information Science / Systems (GIS) Master of Science programme is offered as double degree in English language.

Geospatial technologies and underlying concepts have become indispensable elements in today's information society, location connects ('joins') information assets and provides the context for perceptions, decisions and actions. A lack of qualifications has been identified by multiple actors as a key bottleneck and impediment for more broadly leveraging the potential of Geoinformatics to managing our world in all its geospatial facets, including addressing Sustainable Development Goals."

4 Summarizing results from the assessments of the experts

„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[1] 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

[1] Self-Evaluation Report

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

Recommendations
The experts make the following recommendations for the further development of the programme:

Ad 1.1. Status
„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."

Ad 1.3. Cooperation Agreement
„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."

Ad 3.1 Curriculum
„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."

Ad 3.2. Credits
„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."

Ad 3.3. Workload
„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.

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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).“

Ad 4.1. Admission
„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.“

Ad 5.1 Learning and Teaching
„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.“

Ad 8. Transparency and Documentation
„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.“

Ad 9. Quality Assurance
„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 Decision of the AQ Austria Board

The Board of AQ Austria decided in its 73th meeting on 20th March 2022 to grant accreditation without conditions for a period of six years to the *Copernicus Master in Digital Earth (CDE).* The accreditation of the Joint Programme is valid until 19th May 2028.

The quality requirements are being met. The recommendations proposed by the expert panel and supported by the Board of AQ Austria are aiming to support the further development of the Joint Master’s Programme.

The Board of AQ Austria based its **decision** on the self-evaluation report and supporting documents submitted by the Consortium and the review report of the expert panel. The consortium refrained from submitting a formal statement on the report of the experts.

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6 Annex

- Review report of the expert panel as of April 2022

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