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FINAL REPORT

JOHANNES KEPLER UNIVERSITY LINZ (AUSTRIA)
INSTITUT EURÉCOM (FRANCE)
UNIVERSIDAD DE ALCALÁ (SPAIN)
IN COOPERATION WITH UNIVERSITY OF CALIFORNIA-RIVERSIDE (USA)

CONNECTED AND AUTOMATED SUSTAINABLE TRANSPORT SYSTEMS AND MOBILITY (MASTER OF SCIENCE)

January 2026

Content

DECISION OF THE AQAS STANDING COMMISSION

ON THE STUDY PROGRAMME

- **CONNECTED AND AUTOMATED SUSTAINABLE TRANSPORT SYSTEMS AND MOBILITY (CASTSM) (M.SC.)**

OFFERED BY

- **JOHANNES KEPLER UNIVERSITY LINZ (AUSTRIA)**
- **INSTITUT EURÉCOM (FRANCE)**
- **UNIVERSIDAD DE ALCALÁ (SPAIN)**
- **IN COOPERATION WITH UNIVERSITY OF CALIFORNIA-RIVERSIDE (USA)**

Based on the report of the expert panel, the comments by the university and the discussions of the AQAS Standing Commission in its 27th meeting on 1 December 2025, and the circulation procedure of 26 January 2026 the AQAS Standing Commission decides:

1. The study programme "**Connected and Automated Sustainable Transport Systems and Mobility**" (**Master of Science**) offered by **Johannes Kepler University Linz**, **Austria, Institut Eurécom (France)**, **Universidad de Alcalá (Spain)** in cooperation with **University of California-Riverside (USA)** is accredited according to the AQAS Criteria for Programme Accreditation (Bachelor/Master).

   The accreditation is conditional.

   The study programme essentially complies with the requirements defined by the criteria and thus the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and the European Qualifications Framework (EQF) in their current version. The required adjustments can be implemented within a time period of twelve months.

2. The conditions have to be fulfilled. The fulfilment of the conditions has to be documented and reported to AQAS no later than **28 February 2027.** The confirmation of the conditions might include a physical site visit within the time period of twelve months.

3. The accreditation is given for the period of **six years** and is valid until **28 February 2032**, provided that the conditions listed below are fully met. Otherwise, the accreditation may be withdrawn.

Conditions:

1. The consortium must specify, how studies are organised when students decide to visit UC Riverside instead of UAH in their second semester. The impact on learning outcomes, knowledge and skills must be transparently described and compensation strategies which ensure that the students reach the same level at the 3rd and 4th Semesters must be implemented.

2. To avoid that the graduates are trained with technical competence without the context of transport system as a whole, the transport systems engineering competence must be strengthened. There must be disciplinary competence about the operations of such dynamic and complex mobility systems.

3. The ILOs must be revised to improve the transparency of the qualification gained in the programme.

   a. The consortium must carefully review and revise the ILOs in terms of Bloom's taxonomy.
   b. A mapping of the ILOs at the programme level and the course level is necessary to formulate a consistent programme.
   c. The mechanisms to assess whether students have achieved the intended learning outcomes must be clearly explained per course and module.
4. The consortium must check whether it is legally possible to conduct the fourth semester at UAH if a student chooses to spend the second semester at UCR.
5. Clear information about the option to combine the Master's thesis with the 7 ECTS internship must be given. It is necessary to ensure that students are fairly evaluated independently of whether they decide to combine or not the Master's thesis with the internship or not. The overall number of credits that are related to the Master phase (thesis/project/internship) needs to be defined transparently for the students.
6. The planning of exams and the coordination among institutes must be specified, especially when students must resit exams and how this might impact the scheduling of mobility.

The following recommendations are given for further improvement of the programme:

1. AI-based competencies should be explicitly part of the course ILOs in different courses across the programme.
2. Information on the type of lab activities and assessment methods should be provided on a per course level. Complementarity between courses should be clearly identified to avoid any potential overlaps.
3. Partners should consider a more balanced research-professional programme and should balance research competencies (methodological competence) versus professional skills.
4. The training on industrial processes should be strengthened. Softwarization of vehicles and its implications on the CASTSM value chain and the operational framework should be addressed.
5. The programme should integrate in its management course aspects of business management in the connected and automated mobility and transportation industries and integrate entrepreneurship related content to enable the graduates to found their own business.
6. The partners should monitor the current distribution of credits to ensure that students can gain 30 ECTS credits per semester, in particular for the semester at UCR. It should be clarified why there is a 1 ECTS language module.
7. Regulations and processes regarding the possibility to conduct the Master's thesis in an industrial partner organisation should be made explicit (e.g. qualifications of supervisor at the company, confidentiality, publication of the Master's thesis and its results in databases).
8. To improve the knowledge of practical processes and professional skills targeted industrial trainings should be included in the curriculum.
9. Competencies should be defined as minimum entry requirements (profile of knowledge of candidates) in addition to identifying Bachelor's degrees.
10. CASTSM should consider a similar approach for distributing their Erasmus Mundus scholarships to avoid penalizing students in countries where the grading scores are on the lower side in engineering.

11. To the already existing recognition regulations additional regulation on the recognition of prior learning should be added and if there is a limit on the number of credits.
12. More senior teaching staff should be involved in teaching at JKU.
13. The proposal for the programme should identify per course the lab facilities (equipment, SW, etc) that each institution plans to utilize to achieve the ILOs.
14. The information on the CASTSM programme on JKU website should be updated.
15. The feedback loop in quality assurance should be closed by informing the students on the outcome of the course evaluation.
16. It should be made clear how quality assurance processes can be aligned between the partners in the future.

With regard to the reasons for this decision the Standing Commission refers to the attached experts' report.

EXPERTS' REPORT

ON THE STUDY PROGRAMME

- **CONNECTED AND AUTOMATED SUSTAINABLE TRANSPORT SYSTEMS AND MOBILITY (CASTSM) (M.SC.)**

OFFERED BY

- **JOHANNES KEPLER UNIVERSITY LINZ (AUSTRIA)**
- **INSTITUT EURÉCOM (FRANCE)**
- **UNIVERSIDAD DE ALCALÁ (SPAIN)**
- **IN COOPERATION WITH UNIVERSITY OF CALIFORNIA-RIVERSIDE (USA)**

Visit to the university: 22/23 September 2025

Panel of experts:

Prof. Dr. Javier Manuel Gozalvez	Director of the UWICORE laboratory at the Universidad Miguel Hernández de Elche (UMH), Spain
Prof. Dr. Meng Wang	TU Dresden, Chair of Traffic Process Automation, Germany,
Dr. Alessandro Becciu	Nuraxys GmbH, Germany (representative of the labour market)
Tomy Vo	RWTH Aachen, Germany (student representative)

Coordinator:

Doris Herrmann	AQAS, Cologne, Germany

I. Preamble

AQAS – Agency for Quality Assurance through Accreditation of Study Programmes – is an independent non-profit organisation supported by nearly 90 universities, universities of applied sciences and academic associations. Since 2002, the agency has been recognised by the German Accreditation Council (GAC). It is, therefore, a notified body for the accreditation of higher education institutions and programmes in Germany.

AQAS is a full member of ENQA and also listed in the European Quality Assurance Register for Higher Education (EQAR) which confirms that our procedures comply with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), on which all Bologna countries agreed as a basis for internal and external quality assurance.

AQAS is an institution founded by and working for higher education institutions and academic associations. The agency is devoted to quality assurance and quality development of academic studies and higher education institutions' teaching. In line with AQAS' mission statement, the official bodies in Germany and Europe (GAC and EQAR) approved that the activities of AQAS in accreditation are neither limited to specific academic disciplines or degrees nor a particular type of higher education institution.

II. Accreditation procedure

This report results from the external review of the degree programme "Connected and Automated Sustainable Transport Systems and Mobility (CASTSM) (M.Sc.) offered jointly by Johannes Kepler University Linz (Austria), Institut Eurécom (France), Universidad de Alcalá (Spain) in cooperation with University of California-Riverside (USA).

1. Criteria

The programme is assessed against the criteria defined by the European Approach for Quality Assurance of Joint Programmes The criteria are based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) 2015.

2. Approach and methodology

Initialisation

The university consortium mandated AQAS to perform the accreditation procedure in October 2024. The university consortium produced a Self-Evaluation Report (SER). In January 2025, the consortium handed in a draft of the SER together with the relevant documentation on the programme and an appendix. The appendix included e.g.:

- the CVs of the teaching staff/supervisors,
- information on student services,
- as well as academic regulations.

AQAS checked the SER regarding completeness, comprehensibility, and transparency. The accreditation procedure was officially initialised by a decision of the AQAS Standing Commission 19 May 2025. The final version of the SER was handed in June 2025.

Nomination of the expert panel

The composition of the panel of experts follows the stakeholder principle. Consequently, representatives from the respective disciplines, the labour market, and students are involved. Furthermore, AQAS follows the principles for the selection of experts defined by the European Consortium for Accreditation (ECA). The Standing Commission nominated the aforementioned expert panel in August 2025. AQAS informed the university consortium about the members of the panel and the university consortium did not raise any concerns against the composition of the expert panel.

Preparation of the site visit

Prior to the site visit, the experts reviewed the SER and submitted a short preliminary statement including open questions and potential needs for additional information. AQAS forwarded these preliminary statements to the university consortium and to all panel members in order to increase transparency in the process and the upcoming discussions during the site visit.

Site visit

After a review of the SER, a site visit to the university took place on 22/23 September 2025. On site, the experts interviewed different stakeholders, e.g. the management of the higher education institution, the programme management, teaching and other staff, as well as prospective students, in separate discussion rounds and consulted additional documentation. The visit concluded by the presentation of the preliminary findings of the group of experts to the consortium's representatives.

Reporting

After the site visit had taken place, the expert group drafted the following report, assessing the fulfilment of the criteria. The report included a recommendation to the AQAS Standing Commission. The report was sent to the consortium for comments.

Decision

The report, together with the comments of the university consortium, forms the basis for the AQAS Standing Commission to take a decision regarding the accreditation of the programme. Based on these two documents, the AQAS Standing Commission took its decision in a circulation process on 26 January 2026. AQAS forwarded the decision to the university consortium. The university consortium had the right to appeal against the decision or any of the imposed conditions.

In February 2026, AQAS published the report and the result of the accreditation as well as the names of the panel of experts.

III. General information on the universities

CASTSM originated from the collaboration of four renowned institutions: Johannes Kepler University (Austria) (fullpartner/coordinator), EURECOM (France) (full partner), University of Alcalá (Spain) (full partner), and the University of California-Riverside (USA) (associated partner). This partnership was formalized under the Erasmus Mundus Design Measures in 2021 with a partnership composition that was revised and updated over consecutive years, resulting in the current consortium. It builds on the strengths of each partner in ITS, connected automated vehicles, and smart mobility research. The institutions have a history of joint initiatives such as conferences, summer schools, and collaboration in funding acquisition.

Johannes Kepler University Linz (JKU) is an Austrian public university and is entitled to offer study programmes at master level and to offer joint programmes and joint degrees. The university has self-accrediting status; consequently, its study programmes don't require accreditation or similar by any public authority. Being a public university, all its degrees are automatically listed in the national qualification register.

EURECOM is a private graduate school and research centre in digital sciences located in the Sophia Antipolis technology park, Biot, France. It was founded in 1991 in a consortium form, that includes among others Mines Telecom, a public group of engineering and business schools. EURECOM is co-accredited with Institute Mines Telecom by the French ministry of higher education, research and innovation to deliver two French national degrees of Masters of Science in Computer Science and Networks & Telecommunication.

University of Alcalá (UAH) in Spain, is a Spanish public university which brings studies in all branches of knowledge, including technology. It holds more than 2,000 faculty members and more than 28,000 students (undergraduate, master and PhD). The departments participating in this master proposal are: Computer Engineering, Electronics, Signal Theory and Communications, and Economy. These departments provide the expertise that is required to support this programme. The university is entitled to offer study programmes at master level and to offer joint programmes. Being an accredited higher education institution, all its degrees awarded in accredited degree programmes are automatically listed in the National Qualification Register (NQR). In particular, the Technical School of UAH is internationally accredited by EURACE.

In addition to the degree awarding partner universities, University of California, Riverside (UCR) as an associated partner in the consortium, will provide students with the opportunity to complete their second, or fourth semesters of study in California, with the support of industrial sponsorships to cover the associated cost.

University of California, Riverside (UCR) is a public university in the State of California, United States, governed by the UC Regents, which is a quasi-government organization in the State of California. The UC Regents require that all UC schools be accredited by one or more accreditation organizations. UCR is accredited by the Western Association of Schools and Colleges (WASC) Senior Commission and the University Commission. UCR has held this accreditation since 1956 and undergoes reaccreditation by WSCUC every six to ten years, with the most recent review taking place in 2018. All eligible undergraduate engineering programs at the Marlan and Rosemary Bourns College of Engineering (BCOE) at UCR hold accreditation from either the ABET Engineering Accreditation Commission (EAC) or the ABET Computing Accreditation Commission (CAC). BCOE was last evaluated and approved by ABET in 2019, with the next evaluation scheduled for 2025.

IV. Assessment of the study programme

1. Eligibility

1.1 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.

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

1.3 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.

Description

As the SER states, the CASTSM study programme was developed through close collaboration among the four institutions, integrating:

- Stakeholder workshops and industry consultations.
- Alignment with the European Green Deal and global sustainability goals.
- Input from academic, research, and industry partners in transport innovation.

The consortium was strategically composed to offer a comprehensive, interdisciplinary educational experience. Each institution is said to contribute unique strengths:

JKU (Austria): Smart mobility, data analysis, and human factors. JKU will lead the modules focused on intelligent technologies in vehicular environments, smart mobility, and ICT (Information and Communications Technology).

EURECOM (France): Advanced communication systems and IoT. EURECOM will lead the development of advanced modules on communication technologies for transportation.

UAH (Spain): Urban mobility and infrastructure design. UAH will lead the courses on autonomous vehicle control systems, sensor fusion algorithms, and advanced navigation systems.

UCR (USA): Sustainable transport and policy impact. UCR is said to take responsibility for modules exploring the societal impacts of transportation, focusing on the interaction of technology and policy.

This balanced collaboration shall ensure that students gain exposure to diverse methodologies and regional mobility challenges, preparing them for leadership roles in the transport sector.

All partners are involved in the delivery of the study programme distributed as follows:

Summer school (before 1st semester)	JKU with the participation of the partner institutions
1st semester	JKU
2nd semester	UAH *or* UCR
Summer School (before 3rd semester independently of where the students are located at this point)	JKU with the participation of the partner institutions
3rd semester	EURECOM
4th semester	JKU *or* UAH *or* UCR *or* EURECOM

Every facet of the curriculum is said to be developed collaboratively, incorporating diverse perspectives and expertise from each partner institution.

The different and distinct expertise of the partner institutions involved shall complement each other, ensuring a comprehensive education that offers a holistic view of the subject area. By jointly delivering all modules, the programme shall ensure that students achieve the EMJM qualification goals, despite variations in course content across different universities. Administratively, all partners shall equally contribute to work packages and are represented on Boards, ensuring commitment and inclusion in all planned activities.

The collaboration shall enhance each partner's research capacity, strengthen international networks, and foster innovation in teaching and learning.

According to the SER, the members of the consortium developed an agreement which defines the regulations, the governance, the administration of the joint programme as well as the responsibility of all partners. The agreement shall cover in particular the following issues:

- Denomination of the degree 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.

Expert evaluation

All institutions are recognised higher education institutions in their countries. The respective legal frameworks of the three European partners allow them to participate in the joint programme and award a joint degree. University of California-Riverside (USA) is not a full but an associated partner, so that other requirements are applicable.

The panel of experts got evidence from the documents and from the discussions during the site visit that the programme is jointly designed and delivered. The programme consists of six modules, and all partners contribute to all modules, and each partner focuses on the contents more aligned with areas of expertise. In the current design, it is possible that students do not follow any modules in UAH/Spain apart from final thesis, but not all knowledge and skills the students gain at UAH in the 2nd Semester will be obtained from UC Riverside. During the site visit the panel was informed that due to some implications which are related to an associate partnership, most likely only a few students will study in the US. Anyhow, it is not clear what discrepancies between UAH and UC Riverside in terms of learning outcomes, knowledge and skills and compensation strategies are in place to ensure the students reach the same level at the 3rd and 4th Semesters. The consortium must specify this aspect to create full transparency for the students **(Finding 1)**.

The MSc CASTSM is about transport and mobility systems. There must be disciplinary competence about the operations of such dynamic and complex mobility systems. This part of the programme which refers to more systematic aspects must be strengthened **(Finding 2)**.

The draft of the cooperation agreement explains all necessary issues. Additional information on the role and characteristics of the internship in the fourth semester is necessary as well as information on its possible relation with the Master's thesis (see below). How special situations are handled between the partner institutions must be clarified, including student fraud, and resit of courses and exams that need physical presence and lab resources (see Findings in the chapters below).

The admission and selection procedures for students are in general clear. The consortium should pay attention to the diversity and differences in GPAs between different countries and universities.

The mobility of students is guaranteed by the design of the programme. The panel of experts was informed during the site visit that the mobility of teachers is intended but this is not documented in the SER (see below). The experts support the intention of student and staff mobility between the partner universities.

The cooperation agreement was handed in fully signed by all partners in January 2026.

Conclusion

The criterion is partially fulfilled.

2. Learning outcomes

2.1 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).

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

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

2.4 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.

Description

According to the SER, the intended learning outcomes align with the second cycle (master's level) of the FQ-EHEA, characterized by advanced knowledge, skills, and competencies necessary for specialized fields and interdisciplinary contexts. The alignment is also said to be consistent with the applicable national qualifications frameworks in France (Level 7 standards of the Répertoire National des Certifications Professionnelles (RNCP)), Spain (Level 3 in the Spanish Qualifications Framework for Higher Education (MECES)), and Austria (Level 7 qualifications in the National Qualifications Framework (NQR)), which set clear benchmarks for master's level education.

The mission of the curriculum is said to provide comprehensive professional training that enables a unique and dynamic learning experience in an inclusive environment with the aim to equip students with the knowledge and skills necessary to pursue high-quality jobs and become global leaders in the transition towards zero-emission mobility in Europe.

According to the SER, graduates will:

- have gained the necessary expertise and core professional skills to work independently in the field of Connected and Automated Sustainable Transport Systems and Mobility.
- be able to promote and implement international standards related to Connected and Automated Sustainable Transport Systems and Mobility products and services.
- be equipped to contribute to innovation by applying best practices, thereby enhancing the quality and technological excellence of Connected and Automated Sustainable Transport Systems and Mobility applications.
- elevate their level of expertise and professional skills in the field of intelligent vehicles and smart Mobility, ultimately improving European transport services in the long term.

- be able to develop a sustainable mobility vision through independent and critical reflection of new information and knowledge.

As the SER states, Connected and Automated Sustainable Transport Systems and Mobility is an interdisciplinary area that necessitates a comprehensive understanding of various subjects, including telecommunication, computer science, electrical and mechanical engineering, networking, data science, human factors, and transport systems. Therefore, students must possess a Bachelor of Engineering degree in one of the following programmes: Computer (Science) Engineering, Software Engineering, Information Technology Engineering, Electrical and Computer Engineering, Applied Mathematics, Data Science or a related field. As the SER states, students will learn a range of techniques in computer science, telecommunications, automation, sensor technology, human-machine interfaces, and road user behaviour to enhance current systems and support the development of new ones. Additionally, they are said to acquire knowledge of technological aspects while consistently evaluating their influence on safety, sustainability, and other social factors.

To demonstrate that the intended learning outcomes are achieved, the strategy to ensure excellence and innovation in the learning experience follows state-of-the-art methods of higher education didactics, which include gender and diversity methods, according to the SER. The didactic concept of Constructive Alignment is said to be theoretically based on a combination of a constructivist teaching and learning understanding with a results-oriented teaching design. The core content of the concept shall be the alignment not only of teaching and learning activities but also of assessments with intended learning outcomes.

Expert evaluation

The ILOs align with the level 6 / level 7 in the Framework for Qualifications in the European Higher Education Area (FQ-EHEA), as well as the applicable national qualifications framework(s) to some extent. However, the experts have identified several issues of attention.

The ILO comprise a wide and valuable range of knowledge, skills and competencies in the various fields of connected and automated mobility systems where the partners have expertise. But the qualification profiles of the graduates should be more concrete and specific. An example is the formulation: “be able to promote and implement international standards related to Connected and Automated Sustainable Transport Systems and Mobility products and services.” “Promote” is not an easily observable action and hence should be carefully checked in the learning outcome. “Implement standards” can be too easy or too far-fetched for the graduates, depending on what the standards imply in teaching. The formulation “be equipped to contribute to innovation by applying best practices” is not an observable learning outcome. The consortium must carefully review and revise the ILOs in terms of Bloom’s taxonomy and recommended verbs **(Finding 3a)**.

When revising the ILOs aspects of training on industrial processes should be strengthened (see chapter below). Also, AI-based competencies should be explicitly part of the course ILOs **(Finding 4)**.

The students should also be made familiar with transport systems operations in the public sector. The transport systems engineering competence must be strengthened. Otherwise, there is a risk the graduates are trained with technical competence without the context of transport system as a whole (see Finding 2).

It is unclear how the ILOs on course level are agreed among the universities and a mapping of the ILOs at the programme level and the course level is recommended to formulate a consistent programme and be transparent to the students **(Finding 3b)**.

The partner universities of the consortium have the expertise and experience to ensure that the ILOs are achieved. Due to the fact that there are no students yet, evidence on the successful delivery of the ILOs is lacking. The consortium should follow-up on this aspect in the future. The panel of experts would like to point out that the partner universities must be careful to balance research and professional ILOs to ensure the

intended research competence required at the level 6/7 of FQ-EHEA and enhance the employability of students pursuing professions outside research. Moreover, it is not clear that an 18 ECTS Master's thesis is sufficient for the ILOs for a thesis project in a 2-year master of this level. This might be too short compared to other programmes in the European area and a problem to keep the standards high (see below).

Conclusion

The criterion is partially fulfilled.

3. Study programme

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

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

3.3 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.

Description

According to the SER, the CASTSM Joint Master's Programme aims to develop global talent through collaborative academic efforts in the field of Connected and Automated Sustainable Transport Systems and Mobility (CASTSM). The primary objectives are said to be:

- Foster international cooperation and student mobility in higher education.
- Deliver a high-quality, integrated study programme across multiple partner institutions.
- Address industry, policy, and sustainability needs in transportation.
- Increase the visibility of European higher education institutions globally.

The CASTSM programme was established in response to the European Commission's goals for transforming the transport sector, outlined in the EU Transport 2050 Roadmap and the Sustainable and Smart Mobility Strategy. As the SER states, Intelligent Transportation Systems (ITS) play a crucial role in addressing these challenges by reducing congestion, emissions, and improving safety through digitalization and automation. The demand for skills in ITS and connected mobility is growing, necessitating educational initiatives like CASTSM to develop expertise in areas such as sensor technologies, wireless communication, and sustainable transport strategies, according to the SER.

The planned curriculum is comprised of six modules in three semesters with each 30 ECTS:

- Intelligent Transportation Systems with courses in Supply Chains, Transport Networks and Operations Management, Driver Assistance, Autonomous Driving, Public Transport Management, ITS Standardization Activities
- Sustainable Transportation (introduction of relevant technologies to implement sustainable transportation for people and goods),
- Robotics and Autonomy (positioning, mapping, navigation, perception, identification, and localisation of vehicles),
- Human Factors (dynamic and intuitive interfaces, input/output modes such as voice control and haptic feedback, strategies to enable users to understand, trust, and interact with autonomous systems),

- Communication Technology (C-ITS, mobile telecommunication and emerging communication systems, wired and wireless technologies),
- Artificial Intelligence (theoretical foundations and practical applications of AI within Connected and Automated Sustainable Transport Systems)

The Master's project (3 ECTS) and Master's thesis (18 ECTS) and its defence shall take place during the concluding last semester. Alongside this, there are two summer schools - one before the first semester to familiarize students with CASTSM, and the other between the second and third semesters (9 ECTS), which shall focus on regulations and policies that will apply to the EMJM and will be offered by invited personalities from governments and industry of each of the involved countries in the programme. One credit is said to be equivalent to 25-30 hours of study. The student workload, the mobility paths and their administration and the general student's satisfaction are said to be regularly assessed.

Upon successfully completing the degree programme each student shall receive a joint Master's degree. The degree will be awarded on behalf of the degree-granting partner institutions involved in the provision of the degree programme to that particular student and will be testified by a joint diploma.

As the SER states, the study programme requires mobility, which implies to study in a minimum of two countries where the degree awarding partners universities JKU, EURECOM, UAH are located, and these countries must be outside of the country of residence of the students. For the second semester the executive board, in consultation with the associated partners concerned (e.g. UCR), will determine the universities, in which students will be placed based on the number of available lots, according to the SER.

Expert evaluation

The structure and the planning of courses is clear and cover a large number of important topics in the field of connected and automated mobility and transportation systems with faculty that are recognized experts in the field. Summer schools are a good way to introduce the programme and cover regulatory/policy topics addressed by the second summer school.

The structure and content of the current curriculum are in general adequate to enable the students to achieve the intended learning outcomes. However, there are certain aspects that must be reinforced. It is necessary to explain on how courses relate and feed each other (including why their timing) across the two years to ensure the Master's programme achieves its intended learning outcomes and is coherent. Mechanisms to regularly exchange ideas on the courses among faculty staff across partners could be reinforced. The partners should consider adding some electives to support students' specialization on certain areas.

The proposal identifies learning outcomes, knowledge and skills and competence, and shows how the intended learning outcomes align with the Framework for Qualifications in the European Higher Education Area. However, the intended learning outcomes are provided per module, and it is necessary to also identify the intended learning outcomes per course. The programme bases its didactic concept on constructive alignment and provides some examples on how the achievement of intended learning outcomes can be assessed. However, the mechanisms to assess whether students have achieved the intended learning outcomes should be clearly explained per course and module **(Finding 3c)**. The programme should try to balance theoretical training with project-based (hands-on) training. Information on the type of lab activities and assessment methods should also be provided on a per course level. Complementarity between courses should be clearly identified to avoid any potential overlaps **(Finding 5)**. For example, there are mobile communications and networks related courses at UAH and EURECOM but there is no clear information on their content and complementary.

The panel of experts would like to point out that there might be a problem for students who choose between UAH and UCR at the second semester. The course syllabus is different at UAH and UCR, e.g. with respect to

control and prediction systems or mobile communications and networks. Information must be provided on how these differences are going to be addressed for students that chose UCR since the gap between the training at UAH and UCR is already visible through the course syllabus. The planning to address these gaps must be included it in the programme proposal and cannot be addressed individually, e.g. through additional literature (see Finding 1).

Partners should consider a more balanced research-professional programme and should balance research competencies (methodological competence) versus professional skills **(Finding 6)**. Programme is encouraged to include training on industrial processes (e.g. software development, AI validation processes, data management, develop SW from requirements) with active participation of industrial partners, e.g. through guest industrial workshops. The students should also be made familiar with problems of the transport systems operations in the public sector. Additionally, the programme might consider emphasizing aspects related to cyber-security, data management and softwarization in the connected and automated mobility and transportation industries, as well as consider additional content on soft skills (e.g. through guest seminars) **(Finding 7)**.

Introductory management courses are common at the Bachelor level. The programme should consider focusing its management course on business management in the connected and automated mobility and transportation industries and integrate entrepreneurship related content **(Finding 8)**. This would be a good opportunity to engage speakers from industry with a case study-based training approach *(see also the assessment of the labour market orientation below)*.

The current course structure allows a student to obtain a joint degree delivered by UAH even if the student does not spend any time at UAH (if they choose UCR for the second semester). The consortium explained its statement that the CASTSM Executive Board will decide on the countries and order for the students in the mobility path and that it will make sure that the students spending their second semester at UCR complete their master's thesis at UAH. This was not as explicit during the site visit and the panel recommends to the consortium to check whether it is legally possible to make it mandatory to conduct the fourth semester at UAH if a student chooses to spend the second semester at UCR **(Finding 9)**.

The programme defines a structure composed of several bodies where partners are represented and provide means for them to monitor the evolution of the programme and identify adjustments when and where necessary. The main academic bodies meet regularly to identify any necessary adjustment.

The ECTS is applied properly in the programme, including when considering the study period at UCR. The distribution of credits is clear, and the proposal provides clearly its study plan. The partners should monitor the current distribution of credits to ensure that students can gain 30 ECTS credits per semester, in particular for the semester at UCR. It is not clear what is the role and value to have 1 ECTS language module **(Finding 10)**.

The total workload of the Master's programme is 120 ECTS credits and therefore abides to the FQ-EHEA recommendations.

The workload is standard for a programme of this type. One credit is equivalent to 25 to 30 hours of study, and the proposal claims this number varies based on national legislation and regulations at the Partner Institutions. While a fixed equivalence would be best for students, the range of hours provided is reasonable. The programme plans to regularly survey students regarding the workload and quality, and the feedback received will be evaluated by the related academic bodies to identify any potential action or improvement necessary.

The number of ECTS credits assigned to the Master's thesis is within the established limits although there was discussion on whether a higher number of credits would be appropriate for a Master of this level. Information was provided during the on-site visit that the Master's thesis could be combined with the 7 ECTS internship. However, there is no clear information about this option on the proposal. It is also necessary to ensure that students are fairly evaluated independently of whether they decide to combine or not the Master's thesis with

the internship **(Finding 11)**. Additionally, regulations and processes regarding the possibility to conduct the Master's thesis in an industrial partner should be defined (e.g. qualifications of supervisor at the company, confidentiality, publication of the Master's thesis and its results in databases) **(Finding 12)**.

Evaluation of labour market orientation

Several industrial partners of the consortium are known in the automotive field, which provides the students with the possibility to make experience on company applications. Even if not all industrial partners to which the panel was talking to during the site visit were aware of the goals of the "Connected and Automated Sustainable Transport Systems and Mobility (CASTSM)" Master's programme, they highlighted the importance of training future engineers in the expanding area of connected and automated transport systems, since there is a lack of qualified personnel. Moreover, an international Master's programme is instrumental in forging an intercultural mindset among future engineers, which is a capability of critical support due to the international nature of the automotive and transport industry. Therefore, several industrial partners recognised the value of such an international Master's programme.

In the already implemented national programmes of the consortium partners, the industrial partners play a role in advancing applied research by supplying industry relevant topics for Internships, Master theses, and PhD projects to the university partners. This practice should be continued in the consortium. Especially UAH and EURECOM show a long-standing cooperation with the industrial partners. Some members of the dedicated industrial panel have moreover already confirmed their experience and willingness to deliver lectures on topics relevant to their respective sectors. As illustrated in Table III: Semester structure of the CASTSM programme, dedicated slots for possible guest lectures from industrial partners are incorporated into the schedule for each semester.

After completing a Master's degree, many excellent young engineers often lack the knowledge of practical processes and professional skills required in the industry. It is therefore encouraged to include in the Master programme curriculum targeted industrial trainings **(Finding 13)**. This content could be primarily delivered through guest lectures or workshops conducted by practicing industry experts. Besides the topics on autonomous mobility, connected vehicles and software defined vehicles, the trainings should cover key competencies such as modern software development methodologies, rigorous validation processes, best practices in data management, the full lifecycle of developing software from stated requirements as well as enhancing soft skills.

Finally, the consortium partners already offer other programmes aimed at fostering entrepreneurship among the students. It is encouraged to highlight such activities on entrepreneurship during the Master's programme to support students who may wish to pursue the creation of a startup company (see Finding 8).

Conclusion

The criterion is partially fulfilled.

4. Admission and recognition

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

4.2 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.

Description

According to the SER, the applicants must meet the following minimum common application criteria:

- An Engineering Bachelor's degree of 180 ECTS or equivalent degree in one of the following programmes: Computer (Science) Engineering, Software Engineering, Information Technology Engineering, Electrical and Computer Engineering, Applied Mathematics, Data Science or a related field, which is recognised at all partner institutions. The degree must have been obtained at a recognized post-secondary educational institution.
- Proof of English language proficiency (English Level B2)

The eligibility and selection criteria for the joint application and selection procedure are said to comply with the specific requirements for Erasmus Mundus scholarships which will be awarded to the most exceptional applicants worldwide, while ensuring the required geographic balance (no more than 10% of the scholarships will be awarded to students of the same nationality).

The application procedure is said to be jointly organized and implemented by the consortium. After a completeness check, the applications are said to be submitted to the Executive Board for evaluation which will assess the candidates' knowledge, skills, and competencies using certified written proof of their degree programme(s) as well as testing certain areas of knowledge, skills, and competence with the help of experts from the other partner institutions. It is said to follow the shared procedures considering gender balance, inclusion of economically vulnerable students, and students with special needs. The programme offers a maximum of 32 places for each edition.

According to the SER, the Executive Board of the consortium will conduct a weighted assessment based on predetermined criteria, which includes Grade Point Average (GPA) (up to 80 points) and cover and recommendation letters (up to 20 points). The applicants are said to be ranked based on the assessment, and the most suitable candidates will be offered a study place. Applicants who are rejected may appeal under Clause 14 of Article 3 of the Study and Examination Rules. Students who have received a positive decision must register through the JKU in accordance with the university's regulations.

After enrolling, the accepted student and the competent person at the Coordinator Institution representing the Consortium will sign a Student Agreement that covers academic, financial, administrative, behavioural, and other relevant aspects related to the degree programme.

The Admissions Office of JKU is said to administer the recognition of qualifications according to the recognition rules of the university. The recognition of prior learning is said to be based on the principle of course-related recognition. At the student's request, the comparability of learning outcomes they have acquired with the intended learning outcomes of the course they wish to waive will be evaluated according to the regulations of the partner institution that offers the course. If the comparability is established, the completed examinations will be recognized as satisfactory, according to the SER.

Expert evaluation

Admission requirements are clearly defined and the partner institutions target to ensure geographic diversity among students selected.

The list of Bachelor engineering degrees that provide access to the Master is large and open as the proposal refers to Bachelors in related fields. It does though seem appropriate for the programme to explicitly mention automotive and transportation engineering degrees. The CASTSM Master's programme is multidisciplinary in nature. However, the variety of Bachelor engineering degrees granting admission to the programme can pose a significant risk in terms of the students' necessary knowledge to properly follow the CASTSM programme. The consortium partners should define minimum knowledge entry requirements (profile of competencies/knowledge of candidates) in addition to identifying Bachelor degrees **(Finding 14)**.

Admission processes should be planned – as much as possible - according to VISA and related EU entrance processes.

The selection criteria are clearly defined. However, grades of the students represent a very important share in the admission decisions, and grading scores vary a lot per country/region, particularly in engineering where some countries/regions might grade lower than others for the same student level. Some countries have put in place processes for their PhD funding programmes that try to account for these differences doing some kind of normalization to level student GPAs based on their performance at their national level. CASTSM should consider a similar approach for distributing their Erasmus Mundus scholarships to avoid penalizing students in countries where the grading scores are on the lower side in engineering **(Finding 15)**.

The experts encourage the consortium partners to consider introducing interviews in the selection process among a reduced cohort of preselected students to ensure the maximum possible effectiveness of the selection process.

The proposal clearly identifies that recognition would operate at the course level. However, it is not clear if there is a limit on the number of courses/credits that can be recognized with prior learning. The programme should also indicate if industrial/professional experience on the topics of the courses can also lead to recognition with prior learning, and if so, if there is a limit on the number of credits **(Finding 16)**.

The Admissions Office of JKU will administer the recognition of qualifications according to the recognition rules of Johannes Kepler Universität Linz. These rules refer to the Statute of the Johannes Kepler University of Linz, Articles of Study Law, Art 42b, 42c, which should take into account the requirements of the Lisbon Convention. At the time of the site visit the link provided in the SER was not working.

Conclusion

The criterion is partially fulfilled.

5. Learning, teaching and assessment

5.1 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.

5.2 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.

Description

In the SER the consortium states that breaking down learning outcomes into smaller, targeted objectives and creating teaching activities and assessments that cater to different learning styles, shall encourage active learning and provide every student with the opportunity to achieve the desired learning outcomes. It shall foster collaborative work, creative thinking, and practical application of various skills and knowledge by, for example, project-based learning, self-directed learning, flipped classrooms, teamwork, virtual and augmented reality technologies. To ensure that the diversity of the students is considered and respected, various strategies have been designed by the partners of the consortium such as gathering information on students' experiences, and learning preferences, and using inclusive teaching strategies that accommodate diverse learning styles and backgrounds.

According to the SER, the intention is that all partner institutions will work collaboratively to ensure a consistent implementation of the examination regulations and assessments. Regular evaluation of the examination

regulations and assessments is planned to ensure that any necessary adjustments can be made as soon and as far as legally possible and communicated effectively to all stakeholders.

The assessment policy follows a specific approach, wherein each Partner Institution has its own examination regulations for the study programmes that include the courses forming the CASTSM.

The consortium partners describe in the SER that following the constructive alignment pedagogical approach that emphasizes the alignment of learning outcomes, teaching methods, and assessment techniques, the assessment techniques are directly linked to the learning objectives to ensure that students are given opportunities to demonstrate their achievement of these objectives.

Expert evaluation

On the basis of the written documents and the explanations during the site visit, the panel of experts got the impression that teaching and learning are consistently aligned across the consortium, with student-centred methods (such as projects, presentations, and industry-defined problems) used systematically and with explicit awareness of international and diverse cohorts. The programme structure and pedagogical practice credibly support the intended learning outcomes. The consortium partners will gain experiences with the international composition of the student body and different didactical needs in the future. The panel of experts got the impression that the consortium is committed to react on student needs with adequate flexibility.

Assessment methods are varied, linked to course-level ILOs, and include opportunities for retakes. However, the exam planning is not fully specified in the SER. This can be an issue since all universities have a different exam and semester start time. Special situations were not clearly described in the examination regulations, especially when students fail the exam or need special care due to certain disadvantages, e.g. physical disability. The planning of exams and the coordination among institutes must be specified, especially when students must resit exams and how this might impact the scheduling of mobility **(Finding 17)**.

Involvement of industry partners in the delivery and assessment of the programme is planned, but not yet part of the concept in a structured way (see above).

Conclusion

The criterion is partially fulfilled.

6. Student support

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

Description

According to the SER, the Student Support Policy of the consortium combines six principles:

1. Outline why student support is a necessary and appropriate responsibility for all the institutions and all their staff and partners.
2. Set out a coherent approach to providing support for students who need it for whatever reason, incorporating existing staff responsibilities for Personal Tutoring, Safeguarding, Well-being, and following University policies into this integrated framework.
3. Indicate an increased focus on:
    a. Identifying support needs at an early stage
    b. Sharing information appropriately

4. Specify that appropriate processes, systems, guidance, and training are needed in order to enable staff to perform their role in supporting students.
5. Providing a forum for the sharing and dissemination of good practice.
6. Providing additional support to students who need it, contributing to University agendas and including student satisfaction, student retention, staff satisfaction and professional body requirements (qualifications such as education or training, professional experience, etc required).

All partner universities are said to provide mental health education tools, knowledge, resources, and supplies for students and offer opportunities for peer engagement, support, leadership, and professional development. The students of CASTSM can make use out of the infrastructure that is already in place at the partners of the consortium. Each university has its own department for international relations and mobility. The student advisory services are available to assist with academic needs, personal growth, wellness, and provide guidance on any study-related or personal issues that they may be experiencing.

The SER states that all partners of the consortium will ensure that students receive an adequate introduction to the new culture and school environment at their respective premises. This includes access to appropriate library, computer, and learning facilities, as well as support in obtaining visas and residence permits, finding suitable accommodation, and counselling services. Additionally, each partner institution is said to offer language courses, health insurance schemes and information regarding transportation and affordable accommodation. All the enrolled students will be provided by the consortium with a unique insurance that provides cover for students worldwide, according to the SER.

For students in the CASTSM programme summer school will provide a valuable opportunity to become familiar with the diverse resources available at partner universities through their representatives. In this sense, onboarding activities for incoming students are said to be organized that will include orientation sessions, meet-and-greet events, and social activities designed to help students get to know one another and feel welcome in the new cultural environment.

In the SER it is explained for all partners of the consortium that the diversity of students, staff and invited scholars and their needs will be respected and attended to, especially in view of potential different cultural backgrounds, gender balance, special needs, and economically vulnerable students. On the basis of the information in the SER, appropriate infrastructure for students with special needs seems is in place at all partner universities.

Expert evaluation

On the basis of the discussions with the university partners the panel of experts got a positive impression of the support services that are offed by the consortium. They seem to be adequate to enable mobility without jeopardising attainment of the intended learning outcomes. Students receive counselling at all partner sites, are prepared through kick-off meetings and periodic check-ins, and have access to information platforms and individual solutions when needed. Visa issues and internships/theses in industry are administratively supported, including confidentiality arrangements, which facilitates smooth participation in mobility-linked learning activities. These measures help students manage the academic and logistical complexity of relocation and thereby sustain progression towards the ILOs. To ensure reliability across cohorts and sites, however, the currently existing practices should be formalised at programme level into explicit joint procedures and timelines tailored to the specific challenges of mobile students, if national regulations permit. In cases where homogenous practices cannot be installed due to national regulations, clear and timely communication to students is necessary.

Conclusion

The criterion is fulfilled.

7. Resources

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

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

Description

The partners of the consortium have different situations regarding their staff resources:

JKU: Depending on the academic position, a Master's degree, a doctorate or a habilitation (a post-doctoral qualification) or equivalent qualification may be required. In addition to these academic qualifications, the teaching staff at the Johannes Kepler University is required to have research experience and publications in their field of expertise, as well as teaching experience and pedagogical skills. They are also expected to engage in ongoing professional development and participate in academic conferences and other scholarly activities. The academic responsibility for the programme lies with one designated professor, who coordinates the teaching activities and is supported by additional academic staff involved in courses.

UAH: University professors must hold a doctoral degree or a habilitation (a post-doctoral qualification) in their field of expertise. In the SER it is described that the approximately 11 academic staff members are commonly involved in research projects at a national and international level in several fields of knowledge. Guest lecturers on specific topics are also invited.

EURECOM: Professors must hold a doctoral degree or a habilitation (a post-doctoral qualification) in their field of expertise. Assistant professors (i.e. Maître de Conférence) must also hold a doctorate. In addition to these academic qualifications, the teaching staff at EURECOM is required to have research experience and publications in their field of expertise, as well as teaching experience and pedagogical skills. They are also expected to engage in ongoing professional development and participate in academic conferences and other scholarly activities. At EURECOM approximately 8 members of the academic staff are involved in the teaching of this programme.

UCR: Professors at the University of California hold a doctoral degree in their field of expertise. The UCR faculty are measured on their teaching, research, and professional service. They are commonly involved in multiple research projects at spanning local, regional, national, and international levels in a variety of programmes. UCR requests from its staff to publish their scholarly work, having an active presence in journals, conferences, workshops, and symposia.

As the SER states, all cooperation partners provide modern infrastructures and research facilities (multiple research vehicles, mobile robots, driving and virtual reality simulators, software and hardware platforms, high-performance computers, laboratories, high equipped classrooms, communication systems, various sensors. During the on-site visit of the panel of experts the infrastructure of JKU was visited.

Expert evaluation

All the faculty are experts in their field, bring a large expertise in the topics covered in the CASTSM program and clearly qualify to deliver high-quality training in this Master. They have also previously collaborated in research and scientific activities, which will strongly benefit a smooth execution of the programme. All the staff identified in the SER adequately qualified both in the subject matter and didactics and have the qualification

necessary to achieve the intended learning outcomes. However, JKU will involve several PhD students in teaching but their profile and expertise (including didactics training) has not been provided and cannot be verified. However, there are significant differences in the profile and number of faculty staff per partner involved in the CASTSM programme. More senior teaching staff should be involved in teaching at JKU **(Finding 18)**. The experts support the plans of the consortium to enable also teaching staff to be mobile and teach on course level at the partner institutions.

The proposal indicates that industrial partners have participated in building the CASTSM programme. However, it is not clear whether the role of industrial partners and speakers would be limited to guest seminars or there will be directly teach in some courses, and if it is the case in which ones. There is good potential for industrial involvement (expertise, relation with the partners, and commitment to the programme) but better communication with the industry is recommendable to ensure CASTSM delivers the kind of training that industry requires and the representatives of the labour market have highlighted during the site visit (see above).

According to the SER, the tuition fees at UCR should be covered through industrial sponsorship, which questions whether there will be real student mobility to UCR in the future. Incentives for industry to sponsor a student for their courses at UCR is not explained and is not actually clear since courses at UCR happen in the second semester and students will have to come back to Europe for their second year. Information on past experience/success stories on attracting such course/student sponsorship in international programmes would be desirable.

Partners have state of the art labs and teaching facilities. Some of the planned activities require access to research laboratories, and it is unclear how this will be organized to ensure there is no disruption to the research and teaching activities while ensuring sufficient access and equipment to CASTSM students to ensure they can achieve the intended learning outcomes. The proposal should identify per course the lab facilities (equipment, SW, etc) that each institution plans to utilize to achieve the ILOs **(Finding 19)**.

No specific mention is made on the use of digital teaching or a specific online learning platform to be used for CASTSM. The consortium pointed out that CASTSM students will receive the same services as regular students, including access to libraries, computer facilities, and learning resource. The expert panel supports these plans.

Conclusion

The criterion is partially fulfilled.

8. Transparency and documentation

8.1 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.

Description

According to the SER, admission requirements and procedures, course catalogue, examination and assessment procedures are documented and can be found in the Consortium Agreement on the CASTSM webpage. It is said that they take into account the specific needs of mobile students. The student handbook contains information about the study programme, academic schedule, mobility scheme, administrative procedures, medical insurance, tuition fees, enrolment procedure, visa & immigration, etc.

The Consortium Agreement is said to provide the required transparency and documentation of the programme.

Expert evaluation

The CASTSM programme provides a well-documented set of requirements and procedure for the admission, and examination, which can be found on the Annex 2. Cooperation agreement, Annex 5 Course syllabi of all partners, Annex 8. Official documents outlining procedure for recognition of qualifications and Annex 9. Students' assessments regulations.

The programme offers a maximum of 32 places for each edition, and the student selection is based on merit, IT skills, letter of recommendation and nationality. No more that 10% of the scholarships will be awarded to students of the same nationality.

In addition, there is a student Handbook (additional Annex 6) that provides information about the study programme, academic schedules, the mobility scheme, administrative procedures, medical insurance, tuition fees, enrolment procedure, the CASTSM-partners, visa & immigration.

The information on the CASTSM programme is present also on JKU website, however the website is outdated, and the information should be changed accordingly **(Finding 20)**.

Conclusion

The criterion is fulfilled.

9. Quality assurance

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

Description

In the SER the partners of the consortium describe that the following principles are applied as basis of the quality assurance activities:

- Shared Responsibility

The Executive Board is said to be responsible for the overall quality and standards of the programme. It shall coordinate the establishment and the implementation of the degree programme to the highest academic standards. Without prejudice to the Consortium Agreement the ultimate responsibility for academic standards in the provision of the courses of the CASTSM rests with the relevant partner institution.

- Efficiency

The quality assurance arrangements are said to be based on -wherever possible- utilizing quality assurance arrangements of JKU as lead and all consortium partners combination instead of adding to these.

- International Acceptance

The quality assurance arrangements shall respect the relevant obligations of the consortium partners and shall have regard to the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and the European Approach for Quality Assurance of Joint Programmes (EA).

The principles are said to follow the general approach of the consortium to take a joint responsibility by implementing processes directly and by implementing oversight of activities by the partner institutions.

To ensure the quality of the programme, its curriculum and its provision, the SER lists three approaches to internal quality assurance and enhancement, namely monitoring (annual monitoring report), feedback (which is collected from all stakeholders) and evaluation (course evaluation surveys are said to be conducted regularly).

Once after completion of the first cohort and then every five years the consortium plans to conduct an internal evaluation of the programme. Purpose is to optimize the curriculum structure, to improve the labour market relevance of the programme, and to improve specific counselling and support offers for students, addressing heterogeneity and inclusion.

Expert evaluation

Quality assurance processes are planned at the consortium level and across the partner institutions and are standard for a programme of this type. Quality is also monitored at the module level. The proposal would benefit from a clearer flowchart of who is responsible for what related to monitoring and quality assurance in the CASTSM programme. Feedback mechanisms have been defined with planned reports to the executive board to discuss any potential action/improvements considering the feedback received. Feedback mechanisms will mostly consist of surveys. The evaluation of the results is the responsibility of the executive board that must also define the measures necessary should any corrective actions be necessary. Meetings of the executive board (as well as administrative staff at the partner institutions) are regularly planned as well as the interaction with other programme boards that will participate in quality assurance. It is though not clear the mechanisms in place for informing stakeholders of any action deriving from a quality assurance process. The feedback loop in quality assurance should be closed by informing the students on the outcome of the course evaluation **(Finding 21)**.

Quality assurance processes are in general aligned with European Standards (ESG). In general, quality assurance will follow JKU arrangements when possible. If this is not possible, it is not clear how can the consortium ensure consistency and comparability of quality assurance outcomes across different partner institutions. It should be made clear how quality assurance processes can be aligned between the partners in the future **(Finding 22)**

The consortium plans an internal evaluation of the programme once after completion of the first cohort and then every five years. The panel of experts would advise that the partners reassess this 5 years planning considering the pace at which technology evolves and the need to ensure CASTSM delivers the most up to date training.

Conclusion

The criterion is fulfilled.

V. Recommendation of the panel of experts

The panel of experts recommends accrediting the study programme "Connected and Automated Sustainable Transport Systems and Mobility (CASTSM) (M.Sc.) offered jointly by Johannes Kepler University Linz (Austria), Institut Eurécom (France), Universidad de Alcalá (Spain) in cooperation with University of California-Riverside (USA) with conditions.

Commendation:

The panel of experts are convinced that the core idea to offer such a programme is well received by industry and society and that the students are made familiar with actual topics. That several partner universities with different backgrounds, competencies and infrastructure agreed to offer such an international programme is very beneficial for future development of teaching and research. There is a need for such a programme and the proposal is promising.

The fact that it is planned to involve the industry in the provision of the programme is another strengths apricated by the panel of experts. Several industry partners are known in the field and seem also to be committed to contribute to the programme on different levels.

The infrastructure to receive international students from different backgrounds is available at all partner universities and also support services for different target groups seem to be available for them.

Findings:

1. The consortium must specify, how studies are organised when students decide to visit UC Riverside instead of UAH in their second semester. The impact on learning outcomes, knowledge and skills must be transparently described and compensation strategies which ensure that the students reach the same level at the 3rd and 4th Semesters must be implemented.
2. To avoid that the graduates are trained with technical competence without the context of transport system as a whole, the transport systems engineering competence must be strengthened. There must be disciplinary competence about the operations of such dynamic and complex mobility systems.
3. The ILOs must be revised to improve the transparency of the qualification gained in the programme.
   a. The consortium must carefully review and revise the ILOs in terms of Bloom's taxonomy.
   b. A mapping of the ILOs at the programme level and the course level is necessary to formulate a consistent programme.
   c. The mechanisms to assess whether students have achieved the intended learning outcomes must be clearly explained per course and module.
4. AI-based competencies should be explicitly part of the course ILOs in different courses across the programme.
5. Information on the type of lab activities and assessment methods should be provided on a per course level. Complementarity between courses should be clearly identified to avoid any potential overlaps.
6. Partners should consider a more balanced research-professional programme and should balance research competencies (methodological competence) versus professional skills.
7. The training on industrial processes should be strengthened. Softwarization of vehicles and its implications on the CASTSM value chain and the operational framework should be addressed.

8. The programme should integrate in its management course aspects of business management in the connected and automated mobility and transportation industries and integrate entrepreneurship related content to enable the graduates to found their own business.
9. The consortium must check whether it is legally possible to conduct the fourth semester at UAH if a student chooses to spend the second semester at UCR.
10. The partners should monitor the current distribution of credits to ensure that students can gain 30 ECTS credits per semester, in particular for the semester at UCR. It should be clarified why there is a 1 ECTS language module.
11. Clear information about the option to combine the Master's thesis with the 7 ECTS internship must be given. It is necessary to ensure that students are fairly evaluated independently of whether they decide to combine or not the Master's thesis with the internship or not. The overall number of credits that are related to the Master's phase (thesis/project/internship) needs to be defined transparently for the students.
12. Regulations and processes regarding the possibility to conduct the Master's thesis in an industrial partner organisation should be made explicit (e.g. qualifications of supervisor at the company, confidentiality, publication of the Master's thesis and its results in databases).
13. To improve the knowledge of practical processes and professional skills targeted industrial trainings should be included in the curriculum.
14. Competencies should be defined as minimum entry requirements (profile of knowledge of candidates) in addition to identifying Bachelor's degrees.
15. CASTSM should consider a similar approach for distributing their Erasmus Mundus scholarships to avoid penalizing students in countries where the grading scores are on the lower side in engineering.
16. To the already existing recognition regulations additional regulation on the recognition of prior learning should be added and if there is a limit on the number of credits.
17. The planning of exams and the coordination among institutes must be specified, especially when students must resit exams and how this might impact the scheduling of mobility.
18. More senior teaching staff should be involved in teaching at JKU.
19. The proposal for the programme should identify per course the lab facilities (equipment, SW, etc) that each institution plans to utilize to achieve the ILOs.
20. The information on the CASTSM programme on JKU website should be updated.
21. The feedback loop in quality assurance should be closed by informing the students on the outcome of the course evaluation.
22. It should be made clear how quality assurance processes can be aligned between the partners in the future.