



ASIIN Seal

Accreditation Report

Master's Degree Programme
Space Studies

Provided by
International Space University, Illkirch, France

Version: 17.09.2021

Table of Content

A About the Accreditation Process.....	3
B Characteristics of the Degree Programme.....	4
C Peer Report for the ASIIN Seal	5
1. The Degree Programme: Concept, content & implementation	5
2. The degree programme: structures, methods and implementation.....	13
3. Exams: System, concept and organisation.....	18
4. Resources	20
5. Transparency and documentation.....	22
6. Quality management: quality assessment and development	24
D Additional Documents	26
E Comment of the Higher Education Institution (02.08.2021)	27
F Summary: Peer recommendations (26.08.2021)	33
G Comment of the Technical Committees	35
Technical Committee 01 – Mechanical Engineering/Process Engineering (06.09.2021)	
35	
Technical Committee 02 – Electrical Engineering/Information Technology (03.09.2021)	
35	
Technical Committee 06 – Engineering and Management, Economics (02.09.2021)	36
H Decision of the Accreditation Commission (17.09.2021)	37
Appendix: Programme Learning Outcomes and Curricula	39

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for ¹	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) ²
Master of Science in Space Studies	/	ASIIN	/	01, 02, 06
<p>Date of the contract: 18.05.2021 (former: 19.03.2015)</p> <p>Submission of the final version of the self-assessment report: 23.04.2021</p> <p>Date of the audit: 07.-08.06.2021</p> <p>at: Due to continuing travel and safety restrictions caused by the Covid-19 pandemic, the audit was carried out digitally in agreement with the principal decision of the ASIIN Accreditation Commission.</p>				
<p>Peer panel:</p> <p>Prof. Dr. Madhukar Chandra, Chemnitz University of Technology</p> <p>Prof. Dr. Bernd Dachwald, FH Aachen University of Applied Sciences</p> <p>Prof. Dr. Ralf-Jürgen Dettmar, Ruhr-University Bochum</p> <p>Dr. Christoph Hanisch, FESTO AG</p> <p>Carsten Schiffer, Master student at RWTH Aachen</p>				
<p>Representative of the ASIIN headquarter: Christin Habermann, M.A.</p>				
<p>Responsible decision-making committee: Accreditation Commission</p>				
<p>Criteria used:</p> <p>European Standards and Guidelines as of 15.05.2015</p> <p>ASIIN General Criteria as of 28.03.2014</p>				

¹ ASIIN Seal for degree programmes

² TC: Technical Committee for the following subject areas: TC 01 - Mechanical Engineering/Process Engineering; TC 02 - Electrical Engineering/Information Technology; TC 06 - Industrial Engineering, Economics

B Characteristics of the Degree Programme

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF ³	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Space Studies	Master of Science (M.Sc.)	/	7	Full time (with option for interruption)	/	12 months	75 ECTS	Yearly in September

For the Master's degree programme Space Studies, the institution has presented the following profile in its brochure (available on its website):

„The ISU Master of Space Studies Program (MSS) is intended for individuals seeking professional development, further academic study, or both [...]. For experienced professionals, the MSS supports career advancement, a shift of career within the space sector or a career move into the space sector. For students who wish to make their career in space, the MSS supports entry into the sector through access to space agencies, space commerce, space research and related actors.

The MSS aims are to:

- Provide an interdisciplinary, international, intercultural (3Is) Master's course for highly-motivated students from a diverse range of educational, cultural and professional backgrounds.
- Deliver high-quality 3Is education in the space domain and associated areas which both enhance students' knowledge, skills and effectiveness and offers them the opportunity to achieve their full potential
- Maintain, promote and build productive links with the global space community, including ISU alumni, and use these to provide a contemporary 'real world' dimension to the program.
- Produce graduates capable of contributing effectively and holding responsible position within the global space sector."

³ EQF = The European Qualifications Framework for lifelong learning

C Peer Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Academic Handbook
- Module Handbook
- Programme Description
- Programme Handbook
- Diploma Supplement
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

For the degree programme under review, the International Space University (ISU) presents an extensive description of the learning outcomes in the self-assessment report (SAR). These learning outcomes are anchored in the Programme Handbook of the Master's degree programme and published furthermore on ISU's website and its information brochure.

The auditors discuss the learning outcomes, which can be found in their entirety in the annex of this accreditation report, with regard to the following criteria: the level of academic qualification aimed at, whether the intended qualification profiles allow the students to take up an occupation corresponding to their education, and which stakeholders are involved in the continuous assessment and further development of the objectives. The auditors refer to the ASIIN General Criteria and the European Standards and Guidelines (ESG) for judging whether the objectives and intended learning outcomes of the degree programme, as defined by ISU, correspond. The auditors thus judge the transparency of the qualification objectives but especially their compliance with the respective criteria and come to the following conclusion:

The auditors understand that the entire programme aims at delivering the students an interdisciplinary approach to the field of space. As such, according to ISU, the learning outcomes have been defined to fulfil the broader goals of the programme, considering the diversity of the student body, in particular in terms of their career stages, experience and goals but also in terms of their area of expertise. The objectives thus cover the following eight disciplines: 3I Space; Space Engineering; Space Science; Human Performance in Space; Space Applications; Space Management and Business; Space Policy, Economics and Law; Space Humanities.

While keeping the interdisciplinary approach in mind, the auditors miss any subject-specific goals or learning outcomes that go beyond the social skills to be acquired by the students. While the study programme is set out to “deliver high-quality 3Is education in the space domain”, “maintain, promote and build productive links with the global space community” and “produce graduates capable of contributing effectively and holding responsible position within the global space sector” the auditors are left uncertain *what* knowledge and hands-on experience the students gain in order to reach these goals and *how* these goals relate to an EQF level 7. While they laude the social skills the students gain as well as the many networking opportunities available to them, they believe that these are only really useful as an “add-on” to subject-specific skills.

The auditors furthermore inquire the employment options for graduates from this degree programme. According to ISU, the learning outcomes have been defined to fulfil the broader goals of the programme, considering the diversity of the student body, in particular in terms of their career stages, experience and goals but also in terms of their area of expertise. As such, the programme offers graduates a career in diverse academic disciplines concerned with space and thus the employment options are as varied as the interests or preceding education of the students. ISU presents a list, showcasing the career paths of former graduates. It becomes visible that many of them have found employment in national or international space agencies or astronaut centres or other high positions in organisations or companies related to space activities. The diversity of the career paths also reflects ISU’s claim to expose the students to the various dimensions of space that connect with Biology and Medicine in extreme environments, Engineering and Communications as well as Business or Management. Despite the students’ obvious success on the labour market, the auditors remain that the qualification goals, in certain aspects, currently lack the level necessary for a Master’s programme as they remain very vague in general and focus too heavily on the social skills and networking competencies of the graduates.

In addition, the unique selling point of this programme, its “generalist education”, is currently not stated clearly enough in the qualification goals. It must be made very clear that

graduates of this programme are not experts in space studies or space-related fields but hold a general, interdisciplinary overview of these areas.

In summary, the peers consider the qualification objectives to be too broad and too general as they do not explain the generalist education of the students. In addition, the qualification goals do not meet EQF level 7 as they focus on social skills, which in their absolute necessity, do not replace subject-specific competencies and skills.

Criterion 1.2 Name of the degree programme

Evidence:

- Programme Handbook
- Module Handbook
- Diploma Supplement
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors discuss the name of the degree programme Space Studies and generally agree that, albeit being not very specific, it matches the over-arching, broad and interdisciplinary approach of the programme. As ISU mentions on-going discussions about changing the title and asks the auditors for any possible ideas. The auditors state that one possible option would surely be to leave the original title but add two minors, “Space Administration” and “Space Science”, depending on the prior knowledge of the students and the trajectories they thus choose during the course of their studies. It would also be possible to re-name the study programme to “Master of Space Sciences” as this title would indicate the range and spectrum of the study programme without giving rise to the suspicion that all graduates are scientists in the classical sense.

Criterion 1.3 Curriculum

Evidence:

- Study Plan
- Academic Handbook
- Module Handbook
- Module Guides
- Programme Description
- Programme Handbook

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The MSS is structured as a one- or two-year programme. The first year is essentially a theoretical one and is delivered primarily at the ISU Central Campus in Strasbourg. Some students will take only this year and graduate with a Master of Space Studies. During the first year, students who perform at an appropriate level may apply for the second ‘thesis’ year in which they perform a single extended project or scholarly activity, either at ISU, or at appropriate host institutions. Since the second year is non-obligatory, this accreditation procedure focuses only on the one-year study programme. When using the term “Master of Space Studies” or “MSS”, the one-year programme is referenced.

The MSS programme has a duration of one year and consists of 75 ECTS. As detailed under criterion 2.2, it is noteworthy here, that ISU equates 1 ECTS point with 23 hours of work, which is below the minimum of 25 working hours per ECTS as set by the ESG. Using 25 working hours as a foundation, the MSS programme actually consists of 69 ECTS.

The programme consists of three types of modules: core modules, practice modules, and elective modules. Core modules are mandatory modules designed primarily to deliver academic programme content and are thus broad and interdisciplinary in their scope. Core modules are “Introduction to Space” and “Interdisciplinary Space Studies”. Practice modules are mandatory student-activity focuses modules, designed to deliver experience in the application of academic programme content in a broad 3Is context. The three practise modules are “Internship”, “3I Team Project”, and “Individual Project”. Finally, students must take two elective modules. The offered modules may change based on both resources and uptake but include, for example, “Life Support Systems for Future Human Space Voyages”, “ChipSat Spacecraft and Mission Design” or “Astrobiology”.

In their SAR, ISU describes how each of the eight disciplines (s. criterion 1.3) is reflected in the curriculum and especially the modules.

The individual modules vary in size: “Introduction to Space” has 10 ECTS, “Interdisciplinary Space Studies” 20 ECTS, the team as well as the individual projects both amount to 12 ECTS, while the elective modules have 3 ECTS each and the internship 15 ECTS. Especially with regard to the modules “Introduction to Space” (Module 1) and “Interdisciplinary Space Studies” (Module 2), the auditors remain uncertain of the actual contents of the modules and the depths in which different topics are covered. They refer to the module descriptions for clarification. Accordingly, Module 1, which lasts for approximately seven weeks, aims at

covering “all the topics in the different MSc subjects, i.e.: Intercultural/International competences, Interdisciplinary learning, work and research skills, [...] Astrodynamics, Spacecraft design, Space System Engineering, Space Physics and Technology, Astronomy and Astrobiology [...].” Similarly, Module 2 also seems to cover a wide range of topics, including “space transportation systems, robotic and human spacecraft, astrobiology, space astronomy and astrophysics, medico-biological aspects of spaceflight, space debris, legal aspects of space activities, national space policies, cost engineering and risk management, contract negotiation and regulation.” The auditors acknowledge the merits of all mentioned topics, yet it seems impossible to them to cover these various fields within the scope of one module. This issue remains especially prevalent when considering EQF level 7 to which a Master’s programme must adhere.

The auditors understand that this study programme is incomparable to others on the market and that its strength lies in the interdisciplinary approach to the field of space. In comparison to other, subject-specific degree programmes that cover one aspect of space (e.g. astronomy, astrophysics, or space engineering), this programme aims at creating graduates with a generalist approach to the matter, who are well-versed and capable to work in many space-related disciplines. While this interdisciplinary approach is surely laudable, the auditors nonetheless believe that a certain degree of professional knowledge and expertise must also be delivered to the students. Given the short amount of time, it seems impossible that all topics mentioned in the module description can be covered, especially in a depth necessary to justify the Master’s level of the programme. To be clear, the auditors do not expect students to become experts in all of the topics mentioned, yet students must profess knowledge that goes beyond the mere basics. While the auditors, due to unspecific module descriptions, cannot with indubitable certainty state what precisely is taught in each module and to which degree, they assert from looking at the mentioned literature as well as the exams (cf. criterion 3) that a level 7 of EQF is not reached.

What makes it difficult to impart in-depth knowledge, besides the shortness of the programme, is the fact that any Bachelor’s degree is eligible to enter the programme (cf. criterion 1.4). Hence, students have different professional backgrounds, such as engineering, natural sciences, architecture, humanities, medicine, law or art. While certainly supporting the interdisciplinary approach of the programme, the diversity of the students’ prior knowledge makes an in-depths study of the field impossible as, for example, students with a humanitarian or arts background must first be introduced to the rudimentary basics of mathematics, physics, and engineering. Vice versa, students with an engineering background must be introduced to the basics of sociology, politics, law, medicine, etc. On this basis, the mentioned topics can only be covered in a superficial way that, while giving an interdisciplinary overview, do not match EQF level 7. The auditors suggest redesigning the

introductory module so that it is better oriented towards the different prior knowledge of the students. For example, rather than a single module, there could be several modules, each based on a core competence or topic. Thus, only students without an engineering background would have to learn fundamentals of science and engineering; students with an engineering background could instead learn fundamentals of humanities. This allows for an alignment of students' knowledge at a lower level without students having to repeat knowledge they already know.

The auditors learn from the students and the programme coordinators that in-depths knowledge is taught in the elective modules, which change frequently given the lecturers available. Currently, students can choose two of the following modules: “Space Pharmacology”, “Interstellar Studies”, “Remote Sensing and Image Processing”, “Astrobiology”, “Space Negotiation and Business Development” and “new Space and Entrepreneurship.” The auditors like these elective modules tremendously, as they showcase one of ISU’s strengths: the expertise of its various lecturers, both permanent and external (cf. criterion 4.1). Unfortunately, each elective only amounts to 3 ECTS and as such to a very small part of the overall curriculum. The auditors thus suggest increasing not only the amount of elective modules but also their scope, meaning that elective modules should take up a larger part of the curriculum.

In addition, the auditors clearly see that the interdisciplinary, intercultural and international goals of the study programme are implemented in various modules, such as the team project, the individual project or the internship. Especially the team project allows the students to develop key qualification competences that are often lacking in other Master’s degree, much to the disadvantage of the industry or agency the alumni finds employment. ISU graduates thus dispose of fundamental skills such as intercultural communication, problem solving, presentation, negotiation, time management, team work and team lead, skills the students can apply and deepen during the mandatory internship.

The auditors believe the curriculum of the MMS programme holds immense potential, especially due to the long and outstanding connections to renowned agencies, institutions and companies in the global space-sector as well as the highly qualified staff members at ISU. The interdisciplinary approach is certainly a unique selling point of the programme and it serves a need as all alumni find a promising career after graduation. However, the programme currently relies too heavily on fundamental knowledge without taking into account the necessary depths a Master’s level programme must have. While the elective modules certainly reach this level, especially Module 1 and Module 2 must be re-designed accordingly.

Criterion 1.4 Admission requirements

Evidence:

- Academic Handbook
- Programme Handbook
- ISU Admissions Procedure
- Applicant Interview Process
- Statistics of students
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The application process for the MSS programme is published and anchored in the Academic Handbook. Applications must be submitted through the official application forms to the Admissions Office at the ISU Central Campus in Strasbourg and application forms must be completed online through the ISU website.

On its website, ISU states that applicants are primarily chosen “on the basis of their academic and professional qualifications, their achievements and their proficiency in English. Applicants must have a Bachelor’s degree or the equivalent, including three years of studies as a minimum, awarded by an accredited university. [...] Preference is given to applicants holding higher academic degrees and to applicants with professional experience in industry, government, agencies or academic institutions. [All] applicants to ISU programs must demonstrate that they are sufficiently proficient in English to follow classes and to conduct project work.”

These admission requirements, however, are very vague and leave room for interpretation. For example, it remains unclear what constitutes the necessary proficiency in English. In addition, if preference is given to applicants holding higher academic degrees or professional experience this must be defined more clearly. Applicants must be informed, for example, if a PhD degree is ranked higher than a previous Master’s degree, whether all Master’s degrees are ranked the same and if every prior job experience is counted beneficial towards the admission or only those from certain sectors.

The Academic Handbook specifies the level of English necessary for applicants but is unfortunately not published on ISU’s website so that potential students will not get this information. In addition, the Academic Handbook also remains rather vague when it comes to admission criteria as it focuses on “excellence”, “motivation” and “commitment and open-mindedness” yet without stating how these factors are to be ranked.

Additionally, the academic handbooks reads that the students are ranked based on “their academic qualification, their background, and their nationality, so that the class profile complies with the 3-Is of ISU.” For the last nine cohorts (2013-2021), 2/3 of the students held a Bachelor’s, 30% a Master’s and 3% a PhD degree. 25% had no former professional experience while 40% had 1-3 years of experience and 36% more than 3 years of experience. 53% were engineers, 12% physicists and 7-8% held a background in life sciences, humanities or business and management. In terms of nationality, 40% came from Europe, 26% from Asia, 19% from North America and 4-6% each from South America, Africa and Oceania. While an interdisciplinary and intercultural cohort is beneficial to anybody involved, it remains unclear whether otherwise qualified applicants are denied based on their nationality or their professional backgrounds.

With regard to the process of application, each applicant is requested to submit the completed standard online form, a curriculum vitae, a motivational letter and copies of academic transcripts showcasing that the student already holds a Bachelor’s degree or equivalent (EQF 6). In addition, two reference letters are to be sent independently by referees to the admission office.

Two experienced ISU faculty members will independently examine the application package sent to them and will remotely interview the candidate. Both faculty members will not exchange their assessment and will hand it in to the admission office. The basis of the decision is made upon the basis of a letter grading given per candidate. A table, noting the grade and its descriptors, is published as well.

Beginning in 2021, an interview is systematically scheduled with the candidate and the two evaluators, which is also attended by the Executive Assistance, whenever possible. A standard list of ten questions has been agreed upon by the faculty. Evaluators may deviate from the list depending on the profile of the candidate, may add additional questions to resolve uncertainties presented in the written application or follow-up on the information provided there. In case of differing opinions between the two evaluators, the Head of Admission may ask third evaluation or decide for an Admission Committee meeting.

While the process of application is generally satisfying, ISU mentions in the self-assessment report, that currently there is no regular meeting to homogenize the evaluation between the different evaluators, meaning that the interpretation of the criteria listed differs from evaluator to evaluator.

In summary, the auditors agree that ISU must define admission criteria that are binding and that do not allow arbitrariness in the selection of applicants.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

Based upon the comment of the university and the additional material presented (cf. chapter E), the auditors deem criterion 1 to be not fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Academic Handbook
- Module Handbook
- Programme Handbook
- Overview of MSS partners
- Statistics of students
- Employment Survey
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The study programme under review is divided into modules, which comprise a sum of teaching and learning units. The MSS programme consists of altogether seven modules, ranging from 3 to 20 ECTS. The period of the individual modules also varies, so that not all modules are one semester long.

Module	ECTS	Lengths
Introduction to Space	10	6.5 weeks
Interdisciplinary Space Studies	20	5.5 months (22 weeks)
3I Team Project	12	6.5 months (22 weeks)
Individual Project	12	6.5 months (22 weeks)
Elective Modules	3	2 weeks
Internship	15	12 weeks

ISU admits that the scheduling of the programme makes it impossible to coordinate courses with other universities, which typically operate semester-based schedules and it makes it

harder for visiting professors on sabbatical to contribute to those modules that are spread over two university semesters.

The study programme is designed to be completed within one year when studying full-time. However, it is also possible to study part-time by completing at least one module per year within a maximum of seven years. From discussions with the programme coordinators and the students, the auditors understand, that most students finish their studies within the allocated time of one year.

As already mentioned under criterion 1.3, the auditors wish that students could get some in-depths knowledge as currently, when looking at the module descriptions, the sheer amount of topics introduced to the students can allow only a very superficial treatment, especially since the study programme only amounts to 75 ECTS (on a workload of 23 hours per ECTS). The auditors thus see a potential to lengthen the study programme to 1.5 or even 2 years. They have discussed this option with the students and alumni, most of them were very favourable to this idea. A longer programme would give ISU the opportunity, to increase the amount and scope of the elective modules, which are a strong point of the programme. Similarly, the peers also recommend implementing introductory modules that focus on individual areas of expertise (e.g. engineering/natural sciences and humanities) thus allowing those students not familiar in certain areas more time to pick up some fundamentals. In any way, given that currently the value of one ECTS is below the ESG guidelines (25-30 working hours per ECTS), ISU must restructure their programme in any case with regard to the allowed work load.

The auditors also inquire where the students gain 'hands-on' experience besides the work they undertake in the mandatory internship. They learn that in most disciplines taught, laboratorial work is included. For example, in Module 1 (discipline of space science), students perform laboratory-based experiments relating to freefall/weightlessness. In addition, the laboratories on campus (e.g. Biology Laboratory, Physics Laboratory) are frequently used so students can experience what they have learned in theory previously. The auditors learn that the students are satisfied with the practical training they gather even though most of them have already hold some sort of prior experience beforehand. ISU should, however, transparently publish in their module descriptions, which modules contain laboratorial practices.

Mobility

Given the unique nature of the study programme, student mobility in the sense of spending a semester abroad is not of high priority for students of this programme due to various reasons. First, they are mostly international students thus spending the entirety of their

studies outside of their home country. In addition, many students spent the internship outside of France. Second, as mentioned before, neither the programme's structure nor its interdisciplinary approach is not compatible with most other university programme which makes the recognition of knowledge acquired at other universities basically obsolete.

However, ISU has set guidelines that allow that the regular internship credits can be granted to some students for their prior experiences and/or learning, based on a written report which demonstrates their achievement of learning and that it maps with the aims of the M5-INT module. This option offered to the students with an appropriate background, is called "Accreditation of Prior Learning".

The auditors see that the MSS programme in itself is a highly international and intercultural programme that offers the students the opportunity to spend at least three months abroad during the internship and thus furthers the mobility of its students.

Criterion 2.2 Work load and credits

Evidence:

- Academic Handbook
- Programme Handbook
- Module Handbook
- Module Guide
- Statistics of students
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The number of working hours per ECTS is, according to the module descriptions and study plan, 23. This value contradicts the value set in the ESG of 25-30 working hours per ECTS point. The ECTS credits must be adjusted accordingly.

Notwithstanding the actual amount of ECTS for the programme, the auditors notice that the workload seems quite high. The programme coordinators agree with this assessment and that the workload increases gradually over the year, thus allowing students to ease into their new degree programme. The first module is dense but allows the students to adjust to the program, with mostly the resident faculty teaching the lectures and no parallel module. The first part of the next period, between Break A (end of October) and Break B (mid-December) is more intense with lectures and primarily literature review for TP and IP

and organizing the work with the TP team. Between Break B (early January) and the deadlines for Team Project and Individual Project reports are extremely intense, before the pace slows down during the Electives until the internship period.

In the discussion with the students, the auditors learn that the workload is indeed intense but manageable, that they are satisfied with the overall distribution of the workload and that some students even have time for other projects such as finishing their PhD. The auditors notice, however, that the students' workload is not regularly surveyed or monitored and thus might actually be lower or higher than estimated by ISU. As such, ISU must implement a way of regularly monitoring the workload, e.g. through a student survey after each module or each year of study and, in case any mismatches between expectation and reality appear, adapt the course content accordingly.

In conclusion, it becomes apparent to the auditors that the workload seems generally suitable; yet it must be monitored and the overall credit system must match the guidelines set by the ESG.

Criterion 2.3 Teaching methodology

Evidence:

- Programme Handbook
- Module Handbook
- Self-Assessment Report
- Discussions during the Audit

Preliminary assessment and analysis of the peers:

According to the Self-assessment report and the module descriptions, all modules include assignments and workshops. During those, students are grouped in teams of 5-6 students and must collectively research, prepare, and present their work.

Three practical modules allow the students to deepen their knowledge in one field of their study, to gain experience in teamwork, and to apply their knowledge in a practical context of a private company, a research lab, or a space agency. All three practical modules represent a comparable amount of work and credits (12 to 15 ECTS).

In addition to the taught and practical modules, several professional visits are scheduled, which allow the students to experience the diversity of space activities developed by the various actors of the space domain, among them space agencies, small and large companies, academic and research labs. For example, in 2019 students visited Airbus in Friedrichshafen, SES (Société Européenne des Satellites) in Luxembourg, IRS (Institute of Space

Systems) in Stuttgart, DLR (German Aerospace Centre) in Lampoldshausen, EuroSpace in Paris, the Astronomical Observatory in Strasbourg and the meteor crater in Nördlingen.

The auditors regard the teaching methodology as one of ISU's strong points as it clearly supports the programmes interdisciplinary and intercultural approach and prepares the students for a career in international teams. Especially the use of various didactical methods and the many highly qualified external lecturers help introduce the students further to working in space-related fields.

Criterion 2.4 Support and assistance

Evidence:

- Academic Handbook
- Programme Handbook
- Anti-Harassment Policy
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors gain a comprehensive impression of the offers related to support and assistance of the students at ISU. The students confirm that an open-door policy is being practiced and that they can always approach all teaching and administrative staff members.

Each student is assigned an advisor, who guides the student at the beginning of the programme and aids the student in finding topics for his individual project or an internship placement based upon his needs and wishes.

The lead of students affairs also provides extensive support of the students, even before they arrive on campus and helps them with migration questions, accommodations and general information about life in Strasbourg. Upon arrival, the lead helps them with many practical aspects of student life, such as registration at ISU or opening a bank account. In addition, ISU also offers a bilingual French/English psychologist to be available to the students if necessary.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

Based upon the comment of the university and the additional material presented (cf. chapter E), the auditors deem criterion 2 to be partly fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation
--

Evidence:

- Academic Handbook
- Programme Handbook
- Module Handbook
- Module Guides
- Sample of Exams and Projects
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

All course content within the reviewed study programme is verified by exams. The examination type, deadlines, weighting, and penalties for delay are described in the module descriptions, which are handed out to the students no later than the first session of the respective module.

The final exam of Module 1 is a 3-hour written exam covering all seven disciplines and the 3IS discipline, and including an interdisciplinary part. Additional time is allocated to students with documented special needs. The Module 2 exams consist of one disciplinary exam and one interdisciplinary exam, once at mid-module, in January, once at the end of the module. The durations are identical to the duration of the Module 1 exam. In case of failure in one of the M1 or M2 exam, a resit is organised within three weeks of the first exam. For all other modules, there will be no resit opportunities for other assessments unless the Module Board is of the strong opinion that exceptional extenuating circumstances exist to merit such an opportunity. For the team project as well as the individual project, the students have to undertake a variety of assignments, including literature reviews, presentations, and reports. The internship is evaluated on basis of a written report and a final presentation.

In case of illness or a few causes of impediment, the student may be allowed by the Programme Director not to take the exam and will generally take a resit within three weeks. Students are entitled to review their written exams in the presence of their advisor once they have been graded. In general, students may discuss their results with their advisor, and if that discussion does not allow to convince the student of the fairness of the evaluation, he may approach the Programme Director.

The auditors discuss the examination system with the students and learn that they are generally very satisfied with it and that nearly all students manage to pass the exams. As such, the drop-out rate is around 3% (or one student every two to three years). They also explain that the workload with regard to the amount of exams is feasible and that the various examination forms help to distribute the workload evenly over the year.

The auditors examine a few sample exams and project reports. They conclude that although these exams test the students' acquired knowledge, they do not correspond to level 7 of the EQF. This goes hand in hand with the general assessment of the evaluators regarding the academic level of the study programme.

With regard to a final thesis or project, the auditors notice that a so-called thesis year, in which a Master's thesis is to be written, is optional for the students and not part of the study programme under review. They thus concentrate on the individual project to assess, whether it fulfils the requirement of a thesis or final project. During the individual project, students perform an individual piece of investigative work under the supervision and guidance of a faculty member and possibly an external supervisor. Students choose their project among a list of topics provided by the Faculty and approved by the Program Director, but may also submit proposals for consideration by the Program Director, having secured a potential resident faculty supervisor.

Although the individual project corresponds to a Master's thesis in its scope of work and general assignment, the evaluators do not recognise the necessary EQF level here either. The work provided is good, but often lacks the scientific focus required for a thesis, especially at Master's level. It is important to the evaluators that students continue to have the opportunity to write their thesis in their chosen field, be it engineering, physics, economics, or humanities. The decisive factor is the scientific nature and depth of the thesis, which should primarily be reflected in the research and the scientific methodology applied.

In summary, the auditors assess that ISU has a system of evaluation in place but that the examinations must reflect the EQF Level 7 of the programme. In addition, it must be ensured that the study programme encompasses a final thesis or final project based upon scientific research and methodology.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

Based upon the comment of the university and the additional material presented (cf. chapter E), the auditors deem criterion 3 to be partly fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Staff Handbook
- Performance Appraisal and Review Plan
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The teaching staff is composed of the central campus resident faculty, and the global faculty. Some of the ISU faculty members are in residence at the Central Campus and are identified as Central Campus Faculty. Other members of the ISU Faculty, Associate Faculty, and Adjunct Faculty are referred to as the ISU Extended (or “global”) Faculty. The tasks and responsibilities of all ISU faculty members are described in the Academic Handbook.

As of March 2021, the resident faculty includes seven full-time professors, one associate professor and one PhD student/research assistant. Each discipline is handled by a discipline lead, who defines the overall objectives for the discipline, teaches a number of lectures, in particular the introductory lectures of Module 1, organizes and grades workshops and assignments, and coordinates the visiting lecturers of the global faculty and the professional visits. To complement the expertise and to allow the students to meet a diverse body of teachers, both in terms of discipline, nationalities and cultures, parts of the global faculty of ISU are involved in the teaching. Visiting lecturers contribute one or several 1-hour lectures, up to a 3-day workshop. The global faculty counts 69 faculty members, 62 adjunct faculty members, and 14 associate faculty members, depending on their involvement in ISU programmes over the past five years. In addition, ISU has teaching assistants, support and administrative staff as well as IT staff.

When reading the curriculum vitae of the staff members prepared by ISU and especially during the discussions with resident and external faculty, the auditors conclude that the teaching staff is highly qualified and covers all areas of expertise necessary for the degree programme. The teaching staff is definitely one of the university’s strong points and showcase not only the quality of the topics taught but also the connection ISU has to every major space-related industry, agency, and organisation world-wide. The external lecturers, highly qualified experts in their respective field, thus not only teach the students but also help them connecting with possible future career opportunities.

In summary, the auditors confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programme. The auditors are impressed by the excellent and open-minded atmosphere among the students and the staff members, which is also supported by an extensive advisory system.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

According to the self-assessment report, there are two mechanisms in place how the teaching staff can request professional training. Firstly, as part of the yearly assessment process, each staff member discusses with the so-called line manager possible development and training for the following year. Secondly, on an ad-hoc basis, and following opportunities that may occur during the year, training and professional development opportunities can be discussed and agreed upon between the concerned staff members, their line management and human resources department. These opportunities include e.g. French language classes, attending a conference or symposium, time management courses, courses on designing and implementing educational courses or the visit to a university or space-related faculty. Funds to attend these trainings or conferences are generally available and the teaching staff is encouraged to undertake these measures. Over the past three years, eight conferences have been attended with the primary goal of keeping the teachers up to date with their field of teaching and research. In addition, many research papers have been published throughout the last couple of years, displaying the ongoing research activities of the staff members.

In summary, the auditors confirm that ISU offers sufficient mechanisms and opportunities for members of the teaching staff, who wish to further develop their didactical and professional skills.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Report
- Presentation of the institute during the audit

Preliminary assessment and analysis of the peers:

According to the self-assessment report and the discussions during the audit, annual MSS programme budget is about 650.000€, including teacher salaries. This amount is covered by the student fees; additional financial support to the programme is available by sponsors.

The programme makes use of several facilities within the building, among them a “Make It Space”, a facility containing electronic equipment, soldering tools and basic mechanical tools, a Biology laboratory, a Physics laboratory, which both contain a variety of equipment used, the details of which are described in the self-assessment report and presented to the auditors during the audit. In addition, ISU has a multipurpose computer centre as well as a library dedicated entirely to literature on all space-related topics.

As the audit was conducted online, the auditors were not able to visit the laboratories and teaching facilities. Through a detailed presentation of the various teaching sites, on and off campus, the auditors were able to gather detailed information about different equipment and its usage by the students. The auditors are convinced that the overall infrastructure of ISU and its campus serves the needs for students and staff very well.

In summary, the auditors confirm that ISU offers enough work spaces and laboratories and that all laboratories are equipped with modern and sophisticated instruments to accommodate the needs of the students as well as the teaching staff in conducting practical training and research activities. In addition, the current funding allows for maintaining this standard and purchasing further instruments if necessary.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

Based upon the comment of the university and the additional material presented (cf. chapter E), the auditors deem criterion 4 to be fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions
--

Evidence:

- Module Handbook
- Module Guides

Preliminary assessment and analysis of the peers:

ISU publishes information about the modules in a module handbook as well as in a so-called module guide, a separate document for each module. The students confirm during the discussions that information about the course is always available online and that details concerning examinations and content are provided at the beginning of each course by the teaching staff.

The auditors review the module descriptions and see that they generally provide some information about the content, learning outcomes, examinations, workload distribution, and grading. However, as has been stated under criterion 1.3, the content mentioned in the module descriptions is not very specific and only lists key words, such as space engineering, space sciences, human performance in space, space application or space policy, economics and law. It is not clear from this what exactly is taught in the individual modules and to which degree. Similarly, the module descriptions do not mention the specifics of the type of teaching. For example, module 1 lists “workshops and hands-on activities”; yet the auditors wish to clarify what is meant by “hands-on activities”, especially with regard to the work undertaken in the laboratories.

In summary, while most necessary information are provided in the module descriptions, they are not very specific and must therefore be formulated more clearly.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Exemplary certificate/diploma
- Exemplary diploma supplement

Preliminary assessment and analysis of the peers:

At graduation, each student is provided with a Diploma as well as a Transcript of Records, detailing the grades obtained for each assessment element. At the moment, ISU does not issue a Diploma Supplement, so that outsiders, especially potential employers or other universities, can neither perceive the objective of the programme nor the qualifications that the students have achieved. This should be corrected as soon as possible.

Criterion 5.3 Relevant rules

Evidence:

- All relevant regulations on the course of studies, access, completion of studies, examinations, quality assurance, etc.,

Preliminary assessment and analysis of the peers:

From the documents provided and the discussions during the audit, the auditors learn that ISU generally follows a policy of open rules and regulations. All required rules and regulations, such as the Academic Handbook or the Programme Handbook, are available on ISU's websites and thus available to students and other stakeholders at all times; full module guides are also provided to the students at the beginning of each course. The only exception is the admission procedure, which is in dire need of more transparent rules (criterion 1.4).

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

Based upon the comment of the university and the additional material presented (cf. chapter E), the auditors deem criterion 5 to be partly fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Academic Handbook
- Self-Assessment Report
- Performance Appraisal and Review Plan
- Self-Assessment Report
- WLO Writing ISU Learning Outcomes
- Discussions during the audit

Preliminary assessment and analysis of the peers:

At ISU, a system of quality management has been introduced and is observed to ensure the ongoing process of development and programme improvement.

The Academic Council of ISU is responsible for ensuring the academic quality of the teaching and research activities and has created a set of policies and standards for the faculty within the overall guidelines as established by the Board of Trustees and in cooperation with the President of the university.

Students are asked each week to grade and comment on the delivery of the lecturers by both resident faculty and visiting lecturers. Summaries of these evaluations are made available to ISU staff. The programme director compiles the results for each resident faculty and passes his or her summary to the Academic Council for its annual meeting at the beginning of each civil year. In addition, every four years, a throughout review of the residential faculty's performance is conducted by interviewing the faculty members and the programme director. Through this system of reviews and evaluation, ISU is capable of noticing problems and fix them in a short amount of time. Since the study programme only lasts for one year, problems the current student might face are mostly resolved after they have already graduated. However, ISU holds close contact with many of its alumni, which are thus involved in the ongoing quality management and improvement of the programme. Similarly, the organisations ISU holds close connections with, such as the companies the students visit for their mandatory internship, also give feedback to ISU on a regular basis. The representatives from said institutes state that they feel their feedback is taken serious and often implemented right away. During the discussion with the students, they appear satisfied with the quality management of ISU and especially appreciate the open-door policy, which allows for many problems to be fixed on short commute.

In summary, the auditors gain the impression that the quality assurance system at ISU and especially with regard to the MSS degree programme is well balanced and involves all relevant stakeholders.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

Based upon the comment of the university and the additional material presented (cf. chapter E), the auditors deem criterion 6 to be mostly fulfilled.

D Additional Documents

Before preparing their final assessment, the panel ask that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

- Statistics on standard period of study, dropout rate and failure rate in the individual modules
- Documents / teaching materials of the following topics of the modules M1 and M2: Space Engineering, Space Sciences, Space Humanities
- Overview of admitted applicants (academic and professional background, nationality, (if applicable) proposed by ...)
- Information on the budget that ISU receives from sponsors (as mentioned in the SAR)

E Comment of the Higher Education Institution (02.08.2021)

The institution provided a detailed statement as well as the following additional documents:

- Statistics on standard period of study, dropout rate and failure rate in the individual modules
- Documents / teaching materials of the modules M1 and M2
- Overview of admitted applicants (academic and professional background, nationality, proposed by)
- Information on the budget that ISU receives from sponsors
- Information on the redesign process of the ISU Master of Space Studies

The following quotes the statement of the university:

Introduction

We would first like to thank the auditors for their time, their interest in our program, their careful review of our objectives, methodology, and outcomes, and for the draft report “ASIIN Seal Accreditation Report/Master’s Degree Programme/Space Studies/International Space University, Illkirch, France.” We also thank the ASIIN office and Mrs. Habermann for their continual support. We value very much the positive comments regarding our team, our student mentoring, and our infrastructure, as well as the specific comments concerning the adaptations needed before accreditation can be obtained.

We are herewith submitting our additional documents and comments as indicated in Sections D and E of the draft report, as follows:

Section D: the requested additional documents are provided separately (Annexes A and B):

- Statistics on standard period of study, dropout rate, and failure rate in the individual modules
- Documents / teaching materials of modules M1 and M2
- Overview of admitted applicants
- Information on the budget that ISU receives from sponsors.

Section E:

Please find below some clarifications on the remarks and recommendations of the draft report, which provide more information regarding “Teaching at the EQF7 level.”

Teaching at the EQF7 level

The learning outcomes of the MSS program include specialized knowledge, critical awareness in a field – and at the interface between different fields, as well as problem-solving skills, development of new knowledge, and work in complex contexts and teamwork.

These outcomes are reached at the end of the MSS program, after completion of the Team Project (M3), Individual Project (M4), Internship (M5), and Electives (M6). The taught modules M1 and M2 currently give the students the knowledge and skills to enter the subsequent Modules and to reach EQF level 7 once they have completed all MSS modules.

Modules 1 and 2

Content

In the absence of relevant “subject-specific criteria” documents, we did not provide some of the necessary information to allow the auditors to judge the depth of our program, especially in Module 2.

To provide this information, we include in Annex B: Information on Modules 1,2, and 4, for each discipline, as delivered to MSS21 (in 2020/21):

- the discipline outcomes, over the entire program
- the curriculum
- the learning outcomes of each lecture.

We also submit the material of a selection of lectures in each discipline, which have been delivered during MSS21 by either central campus faculty or external lecturers, following the auditors’ request for teaching materials of the modules M1 and M2, and to illustrate the depth of knowledge taught in those modules.

Teaching in each of the ISU disciplines is very focused, as illustrated by the following examples:

- the Space Applications discipline is focused on teaching techniques for developing space-derived products from Earth-orbiting satellites, and their socio-economic benefits. The lecture “Remote Sensing Image Processing & interpretation” demonstrates this, as it explains how satellite images are acquired and how their properties determine their applications. This lecture provides a direct link to more entrepreneurial-focused classes and activities such as the Copernicus Seminar on the use of the European Commission’s Copernicus framework satellite data to design practical Earth observation solutions for a business case). One such project, developed by an MSS20 student, was selected as one of three finalists of the 2020 Copernicus Masters Planet Daily Change Challenge⁴.
- in the Human Performance in Space discipline, the fundamentals of visual system physiology are taught briefly for the benefit of students with backgrounds in the life sciences. After this, details of spaceflight-associated neuro-ocular syndrome (SANS) are presented. This topic, involving the degradation of vision on long duration missions, is currently one of the top three roadblocks preventing crewed exploration of deep space. Medical, genetic, and anatomical data from astronauts before, during,

⁴ Dirtsat idea by Christine Tiballi (MSS20), see [planet.com](https://www.planet.com) article.

and after missions are presented by one of the space agency ophthalmologists involved in the initial discovery of the issue. Potential countermeasures linked to possible causes are evaluated and students are encouraged to formulate research plans to fill gaps in knowledge. An associated workshop gives the students hands-on training with diagnostic equipment used in typical vision exams. This cutting-edge space-specific material is not taught in medical or graduate schools, even those with specialization in vision physiology.

We refer the auditors to the teaching material⁵ now provided in Annex B: Information on Modules 1,2, and 4, to illustrate the highly specialized knowledge provided in our M2 lectures.

The auditors note that “the qualification goals [...] focus too heavily on the social skills and networking competencies.” However, the social skills occupy a small fraction of the M1 and M2 modules. They are primarily addressed in M1 and M2 lectures and workshops related to teams and team building, interdisciplinarity, interculturality, and career planning. This corresponds to a total of eight hours. The practical module M3: Team project, allows the students to apply those skills, put the lecture material into action, establish linkages between disciplines, produce new state of the art knowledge on the topic and gain experience on teamwork.

Exam papers

The auditors note that the exams “do not correspond to level 7 of the EQF.” The M1 and M2 modules are examined through disciplinary and interdisciplinary exams, as well as course assignments. The disciplinary exams are the sole assessment of those two modules, M1 and M2. During the interdisciplinary exams, students are required to use the knowledge demonstrated in the disciplinary exams, to assess a problem, and to devise a strategy or compose a proposal. This part of the exam, we argue, requires critical awareness of knowledge at the interface between different fields. Both disciplinary and interdisciplinary exams are equally weighted and count for 30% each of the M2 mark.

In addition to the exams, the students are marked on assignments for 40% of the module marks (both for M1 and M2). In those assignments, students work in interdisciplinary teams of five to six people to analyze and solve a problem. They structure and write a consultant report, a tender to a technical or scientific call for proposals, or a scientific conference paper, to give a few typical examples. In those assignments, the team needs to study contexts that are complex.

We therefore argue that seven-tenths of the module marks are determined by exams satisfying the level 7 requirements. Currently, we use the remaining marks to ascertain that the students have acquired the fundamentals in all the disciplines as well as the space-specific knowledge that they will need to manipulate and organize in the more advanced modules of the program, and in their careers.

Individual discipline focus

All students follow modules M1 and M2, without differentiation based on their background or career goals. Some 40% of the overall study time is dedicated to those two modules.

⁵ See presentations linked from the TMAP document through hypertext.

Therefore, they have rightfully attracted the attention of the auditors. The program and the teaching methodology have been designed in a way that all students regardless of their background can follow those modules and succeed in them—although clearly the study time that they will have to invest to master each lecture will depend on their background.

All other modules, i.e., 60% of the credits, are specialized and will allow each student to define and follow a study path to gain advanced knowledge in the discipline of particular interest for their career goals, building on their past education or professional experience. We would like to describe the modules M3, M4 and M5 accordingly:

- M3 team project: in that module, the team of ~20 students assesses and proposes innovative solutions to the space-related question of interest *addressing all disciplines*. Team members always specialize and contribute in their field of interest or expertise. They will research literature, analyze publications, interact with experts, elaborate solutions, and validate hypotheses, typically in one discipline, so that most of the ~260 study hours that they dedicate to the project are spent focusing on one discipline, giving them time and opportunity for in-depth analysis, at an EQF-7 level, as demonstrated by their discipline-specific contribution in the module deliverables. A fraction of the time is spent on soft skills development such as team interaction, editing, and team management. A couple of students have management and coordination responsibilities as team leaders in addition to their contribution to the literature review and analysis.
- M4 individual project: the subject is selected by the student among a list of topics proposed by the faculty, but some students also propose their own subject. For instance, some students have conducted market analysis for a business idea that they formed before joining the program. It is only in rare cases, and after appropriate exchange with the ISU Faculty, that some students decide to explore a new field of knowledge that does not correspond to their past education or experience, typically when they aim to redirect their career.
To illustrate the depth and methodology of the individual projects, we provide a list of publications that is based on the students' projects (see Section 5 of Annex B: Information on Modules 1,2,4). The list shows the quality of the individual projects that have been peer-reviewed and published in academic journals or have been presented at international conferences.
- M5 internship: similarly, the student usually selects a domain corresponding to their expertise, except when they wish to change their career path. Although this part of the program is not conducted at ISU, it is an important opportunity for the student to gain technical and practical knowledge, which is compiled in an internship report and presented to the ISU Faculty.
- Electives: as recognized by the auditors, the four program weeks dedicated to the electives are the opportunity to dig deeper into two up-to-date space topics.

Individual Project reports, internship, and master thesis

In Section 3 of the draft report (p.19), the auditors are concerned that the study time dedicated to the M4 module, which is about 260 hours spread over 22 weeks, does not allow the students to reach a master level equivalent to a master thesis conducted over six months in a typical two-year master program.

As mentioned earlier, we believe that the time allocated to the individual project allows the student to develop his/her skills in scientific methodology to address a contemporary topic. As evidence of this, we include in Annex B: Information on Modules 1,2, and 4, a list of publications that originate from student research performed as part of their M4 individual project or report.

This element of individual research work that the student accomplishes on-site, during the main part of the program, is completed by the internship, which may or may not include research in a professional environment relevant to their career goals.

While a six-month research project or internship is very valuable for the student, we note that many MSc programs (including two-year European programs) rather propose a three- to four-month internship.

The combined time of modules M4 and M5, is about 700 hours, or five months full-time (when the internship lasts the minimum duration of 12 weeks for a graduation in September). The modules provide the student with diverse experience in applying their expertise, in terms of methodology and environment. Combined, they lead to the writing of two reports and two presentations, equivalent in content and acquired knowledge and skills to a semester-long master thesis.

Other remarks and recommendations

Criterion 1.4 Admissions

We understand the remarks of the auditors that our admission requirements are “vague and leave room for interpretation” and agree with the need for revision and improvement. Before the next round of applications starting in December 2021, for MSS23, we will update our selection goals and methods (as we have already started in July 2021) and prepare new evaluation sheets and information documents by mid-November, in time for our online Open Day.

Our plan is to re-discuss and clarify the profile and distribution of students that we wish to educate, in terms of discipline, geographic origin, and professional and personal experience and goals. ISU wants to maintain its capacity for a fair evaluation of candidates of very diverse profiles, while defining and publishing clear and systematic evaluation criteria.

Each of the evaluation criteria will be graded on a scale of 0 to 5, and each mark will be defined in a document shared within the ISU Faculty.

Regarding the English language requirements, we have asked the ISU Academic Council to revise the requirements stated in our Academic Handbook in view of the current grading scale of external examinations such as TOEFL and British Council/Cambridge Syndicate English Language Service test. The new ISU requirements will be published on our web page.

We also would like to clarify that we do not reject “qualified applicants based on their nationality or their professional backgrounds.” The evaluating ISU Faculty does not formally consider nationality or professional background when grading the applications. Under-represented nationalities may be favored by our admissions system only during the discussion between the candidate and the Admissions Office regarding financial support, with ISU occasionally offering them larger financial support. Annex A: Requested Documents, describes the institutions sponsoring the MSS. The nature and identity of the sponsor, which can be

external (e.g., ESA, CNES) or ISU's own funding, depends on the student's nationality, but its amount usually does not. The only reason that some accepted students have been unable to attend the program due their nationality is because the French Ministry of Interior denied them a student visa.

Information to the students

The auditors recommend describing in the module guides the laboratory work that will take place during each module. This primarily concerns activities in the modules M1, M2, and electives. Taking note of the recommendation, we will include a more detailed section related to laboratory and hands-on work in the new module guides.

ECTS

We agree with the auditors that the number of hours per ECTS, defined 10 years ago, should be adjusted to the current number typically used in the EU. For the next round of applications, we will use a number of 30 study hours per ECTS for an academic year of 60 ECTS.

Diploma supplement

We agree with the auditors that we need a standardized document to inform potential employers and other universities of the objective of the program and the qualifications that our students have achieved. After the summer break, we will prepare a Diploma Supplement on either the EuroPass format or the Diploma Supplement model developed by the European Commission, Council of Europe and UNESCO/CEPES that was transmitted to us by Ch. Habermann.

We enclose a proposed roadmap towards a redesigned program that is based on our discussion with the ASIIN auditors, the auditors' draft report, and numerous inputs from the ISU Academic Council and other stakeholders in the space community (see Annex C: MSS redesign).

We will welcome further advice for a redesign of the MSS program. We are prepared to complete this MSS redesign by January 2022, considering all the comments of the ASIIN accreditation report. This will be conducted by the campus faculty under the supervision of incoming president Prof. Pascale Ehrenfreund and aim at offering a new MSS program in the 2022-2023 academic year.”

F Summary: Peer recommendations (26.08.2021)

Taking into account the additional information and the comments given by ISU the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ma Space Studies	Suspension	/	–	/

Conditions

- V 1. (ASIIN 1.1, ASIIN 1.3) The study programme must be re-designed so that it adheres to EQF level 7. It must be ensured that the competences students acquire in the various space-related fields correspond to a Master's level.
- V 2. (ASIIN 2.1, ASIIN 2.2) The study programme needs to be restructured in terms of its scope. It must be ensured that students have enough time to learn all the necessary content to achieve the qualification goals. In this context, one ECTS point must correspond to a concrete value between 25 and 30 working hours.
- V 3. (ASIIN 3) It must be ensured that the curriculum includes a compulsory Master's thesis or final project.

Requirements

- A 1. (ASIIN 1.1) The interdisciplinary "generalist education", serving as a unique selling point of the degree programme, needs to be communicated more clearly, especially in the qualification objectives and the Diploma Supplement.
- A 2. (ASIIN 1.4) The criteria for the selection of applicants must be defined bindingly and communicated transparently.
- A 3. (ASIIN 1.3) Module descriptions must be provided that clearly express the content, learning methods, practical elements, and qualification goals of each module.
- A 4. (ASIIN 5.3) All important documents (Academic Handbook, Programme Handbook, Module Descriptions etc.) must be available to all stakeholders e.g. by publishing them on the university's website.

- A 5. (ASIIN 5.2) A Diploma Supplement must be issued for all students upon graduation.
- A 6. (ASIIN 1.4, ASIIN 6) Applicants must be given the opportunity to object to their rejection.
- A 7. (ASIIN 6) The students' total workload must be monitored regularly.

Recommendations

- E 1. (ASIIN 1.2) It is recommended to change the name of the programme in order to accurately reflect the objectives and content of the programme.
- E 2. (ASIIN 2.1) It is recommended to increase the number and scope of the electives.
- E 3. (ASIIN 2.1) It is recommended to establish different introductory modules that address the individual prior knowledge of the first-year students.

G Comment of the Technical Committees

Technical Committee 01 – Mechanical Engineering/Process Engineering (06.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the assessment of the auditors.

The Technical Committee 01 – Mechanical Engineering/Process Engineering recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ma Space Studies	Suspension	/	–	/

Technical Committee 02 – Electrical Engineering/Information Technology (03.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the assessment of the auditors.

The Technical Committee 02 – Electrical Engineering/Information Technology recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ma Space Studies	Suspension	/	–	/

Technical Committee 06 – Engineering and Management, Economics (02.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the assessment of the auditors.

The Technical Committee 06 – Engineering and Management, Economics recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ma Space Studies	Suspension	/	–	/

H Decision of the Accreditation Commission (17.09.2021)

Assessment and analysis for the award of the subject-specific ASIIN seal:

The Accreditation Commission discusses the procedure and follows the assessment of the auditors and the technical committees.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ma Space Studies	Suspension	/	–	/

Conditions

- V 1. (ASIIN 1.1, ASIIN 1.3) The study programme must be re-designed so that it adheres to EQF level 7. It must be ensured that the competences students acquire in the various space-related fields correspond to a Master's level.
- V 2. (ASIIN 2.1, ASIIN 2.2) The study programme needs to be restructured in terms of its scope. It must be ensured that students have enough time to learn all the necessary content to achieve the qualification goals. In this context, one ECTS point must correspond to a concrete value between 25 and 30 working hours.
- V 3. (ASIIN 3) It must be ensured that the curriculum includes a compulsory Master's thesis or final project.

Requirements

- A 1. (ASIIN 1.1) The interdisciplinary "generalist education", serving as a unique selling point of the degree programme, needs to be communicated more clearly, especially in the qualification objectives and the Diploma Supplement.
- A 2. (ASIIN 1.4) The criteria for the selection of applicants must be defined bindingly and communicated transparently.
- A 3. (ASIIN 1.3) Module descriptions must be provided that clearly express the content, learning methods, practical elements, and qualification goals of each module.

- A 4. (ASIIN 5.3) All important documents (Academic Handbook, Programme Handbook, Module Descriptions etc.) must be available to all stakeholders e.g. by publishing them on the university's website.
- A 5. (ASIIN 5.2) A Diploma Supplement must be issued for all students upon graduation.
- A 6. (ASIIN 1.4, ASIIN 6) Applicants must be given the opportunity to object to their rejection.
- A 7. (ASIIN 6) The students' total workload must be monitored regularly.

Recommendations

- E 1. (ASIIN 1.2) It is recommended to change the name of the programme in order to accurately reflect the objectives and content of the programme.
- E 2. (ASIIN 2.1) It is recommended to increase the number and scope of the electives.
- E 3. (ASIIN 2.1) It is recommended to establish different introductory modules that address the individual prior knowledge of the first-year students.

Appendix: Programme Learning Outcomes and Curricula

According to Programme Handbook, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree programme Space Studies:

“The ISU Master of Space Studies Program (MSS) is intended for individuals seeking professional development, further academic study, or both, through a one- or two-year graduate degree program.

For experienced professionals, the MSS supports career advancement, a shift of career within the space sector or a career move into the space sector.

For students who wish to make their careers in space, the MSS supports entry into the sector through access to space agencies, space commerce, space research and related actors.

The MSS aims are to:

- Provide an interdisciplinary, international, intercultural (3Is) Master’s course for highly-motivated students from a diverse range of educational, cultural and professional backgrounds.
- Deliver high-quality 3Is education in the space domain and associated areas which both enhances students’ knowledge, skills and effectiveness and offers them the opportunity to achieve their full potential.
- Maintain, promote and build productive links with the global space community, including ISU alumni, and use these to provide a contemporary ‘real-world’ dimension to the program.
- Produce graduates capable of contributing effectively and holding responsible positions within the global space sector.

The following **curriculum** is presented:

