Revised version of the Study and Examination Regulations for the international continuing education Master's degree program Space Engineering at Faculty V – Transport and Mechanical Engineering Systems of Technische Universität Berlin

of 17 December 2025

On 17 December 2025, the Faculty Council of Faculty V – Transport and Mechanical Engineering Systems of Technische Universität Berlin adopted the following Study and Examination Regulations for the international continuing education Master's degree program Space Engineering in accordance with Section 37(1) sentence 1 of the Constitution of Technische Universität Berlin and Section 71(1) no. 1 of the Act on Higher Education Institutions in the Land of Berlin (Berlin Higher Education Act – BerlHG) in the version of 26 July 2011 (GVBl. p. 378), as last amended by Article 21 of the Act of 10 July 2025 (GVBl. p. 270).*)

Contents

I. General Part

§ 1 - Scope of application

(1) These Study and Examination Regulations govern the objectives and structure of the program of study as well as the requirements for and conduct of examinations in the continuing education Master's degree program Space Engineering. They supplement the Regulations governing the general study and examination procedures of Technische Universität Berlin (AllgStuPO) with program-specific provisions.

(2) This is a continuing education Master's degree program pursuant to Section 23(3) no. 2 BerlHG, designed with a strong practical orientation.

§ 2 - Entry into force/Expiry

(1) These regulations enter into force on 1 October 2026 and apply to students who enroll as of the winter semester 2026/2027.

(2) Beyond paragraph (1), these Study and Examination Regulations also apply to all students already enrolled in the Master's degree program Space Engineering at Technische Universität Berlin. Students already enrolled who have registered their final thesis will complete it in accordance with the Study and Examination

Regulations of 6 November 2019 (AMBl. TU 19/2020 p. 305), as amended on 26 March 2025 (AMBl. TU 25/2025).

(3) The Study and Examination Regulations for the Master's degree program Space Engineering of 6 November 2019 (AMBl. TU 19/2020 p. 305), as last amended on 14 September 2022 (AMBl. TU 2/2023) and on 26 March 2025 (AMBl. TU 25/2025), expire upon entry into force of these Study and Examination Regulations.

II. Objectives and structure of the program

§ 3 - Qualification objectives, content and professional fields of activity

(1) Building on the qualifications required for admission, the program prepares students for qualified professional practice in the field of space engineering. A major focus is the study of complex systems and technologies in spaceflight. In particular, students are expected to acquire space-systems competence that goes beyond a purely technical specialization.

Students therefore acquire:

1. Subject-specific competence in fields of space engineering
2. Methodological competence in an engineering-science approach
3. Social competence in intercultural, interdisciplinary and diversity-sensitive communication
4. Systems-engineering competence to solve complex technical problems, taking into account sustainable, resource-efficient and socially responsible approaches

(2) In addition, students develop the ability to take different perspectives, living realities and ways of working into account in technical and organizational contexts. They are enabled to work respectfully, inclusively and reflectively in heterogeneous and international teams and to integrate aspects of gender equality, equal opportunities and diversity into technical decision-making processes.

(3) Students in the program are prepared for careers in international companies and organizations in the space sector. By emphasizing methodological and analytical aspects in teaching, the program also enables students to work in related industries such as mechanical engineering, electrical engineering or automotive engineering. In doing so, they are prepared for work environments characterized by workforce diversity and global collaboration.

(4) Technological progress and high levels of activity in small-satellite research are increasing the use of outer space, which may raise the risk of space pollution to a critical level. In view of these developments, it is particularly important that space engineers have a strong awareness of socially responsible conduct, ethical issues and sustainable development.

(5) Accordingly, topics relating to the avoidance of space debris, in particular under the headings “Space Debris Mitigation” and “Clean Space”, are of high importance within the program. Collaboration with experts from research institutions, as well as study-accompanying projects on technologies for space-debris avoidance, consolidate these contents as a permanent component of students’ subject-matter expertise and awareness of social responsibility.

§ 4 - Start of studies, standard period of study and scope of studies, language of instruction and examination

(1) The program starts in the winter and summer semesters.

(2) The standard period of study, including completion of the Master's thesis, comprises four semesters.

(3) The scope of the Master's degree program comprises 120 credit points.

(4) The curriculum and the entire examination procedure are designed and organized so that the program can be completed within the standard period of study.

(5) The language of instruction and examination is English. In the compulsory elective and elective areas, modules taught in German may also be taken.

§ 5 - Structure of the program

(1) Students have the right to structure their course of study individually. However, they are obliged to comply with the provisions of these Study and Examination Regulations. The sequence of modules is recommended by the sample study plan in Annex 2 to these regulations; this is without prejudice to constraints arising from the definition of academic prerequisites for modules.

(2) A total of 120 credit points must be earned; of these, 90 CP are obtained in modules and 30 CP in the Master's thesis.

(3) The compulsory area comprises 36 CP and is structured into the following areas:

A – Space Technology	21 CP
B – Space System Design	9 CP
C – Space Management and Operation	6 CP
Master's thesis	30 CP

The modules assigned to each area can be found in the module list (Annex 1).

(4) The compulsory elective area comprises 36 CP and is structured into the following areas:

A – Space Technology	at least 6 CP

In Area A, students acquire advanced specialist knowledge in the core fields of space engineering. They develop the ability to analyze, design and assess complex technical systems. The focus is on methodological competence in engineering approaches and on the application of modern technologies and methods used in spaceflight. The aim is to prepare students for demanding tasks in the development, integration and operation of space systems.

B – Space System Design	at least 6 CP

Area B focuses on a systems perspective and the design of space systems. Students learn to plan and implement interdisciplinary projects, design system architectures and integrate different technical disciplines. They acquire competences in project management and in collaborating with international teams in order to develop innovative solutions to complex challenges in spaceflight.

C – Space Management and Operation	at least 6 CP

In Area C, students acquire competences in the management and operation of space missions. They learn to manage operational processes, conduct mission planning, and take into account economic and legal aspects of space activities. The aim is to develop the ability to organize and lead space projects efficiently and to assume responsibility for sustainable and safe space activities.

D - Interdisciplinary at least 6 CP

Area D promotes interdisciplinary competences such as project management, communication, teamwork and intercultural collaboration. Students may also choose modules from related disciplines in order to expand their profile individually. The aim is to strengthen flexibility and adaptability for different professional fields and to foster the ability to solve complex problems in an international context.

The modules assigned to each area can be found in the module list (Annex 1).

(5) In the elective area, modules worth 18 CP must be completed. Elective modules serve to acquire interdisciplinary, additional subject-related and professionally qualifying skills and may be selected from the entire range of courses offered by Technische Universität Berlin and other higher education institutions within the scope of the German Basic Law, as well as from foreign higher education institutions and universities recognized as equivalent. The selectable modules also include modules for learning foreign languages.

(6) In the elective area, an internship completed during the program in a company or research institution may be credited with 6 CP. Further details are governed by the internship guideline.

III. Requirements and conduct of examinations

§ 6 - Purpose of the Master's examination

The Master's examination determines whether a candidate has achieved the qualification objectives in accordance with Section 3 of these regulations.

§ 7 - Master's degree

Upon passing the Master's examination, Technische Universität Berlin, through Faculty V – Transport and Mechanical Engineering Systems, awards the academic degree “Master of Science” (M. Sc.).

§ 8 - Scope of the Master's examination, determination of the overall grade

(1) The Master's examination consists of the module examinations listed in the module list (Annex 1) as well as the Master's thesis in accordance with Section 9.

(2) The overall grade is determined in accordance with the principles set out in Section 68(7) AllgStuPO. For the calculation of the overall grade, module grades and the Master's thesis grade totaling 102 CP are taken into account; ungraded modules and, up to a maximum of 15% of the total study achievement (maximum 18 CP), the modules with the lowest grades are excluded.

Of the excluded modules, at least 6 CP must come from Areas A or B or C, and a total of at least 6 CP must come from the combination of Area D and the elective area.

In the event of tied module grades, i.e., modules with the same grade and the same number of CP, the grades of the most recently completed module examinations are excluded. Only complete modules are taken into account to reach the specified extent; i.e., the extent is undershot if including the next module would exceed the total number of CP intended to be excluded.

(3) Grades excluded from the calculation of the overall grade are marked separately on the degree certificate. The grades of all modules are listed on the degree certificate.

§ 9 - Master's thesis

(1) The Master's thesis is generally completed in the 3rd or 4th semester. It comprises 30 CP. The final thesis consists of a written thesis as well as a subsequent 15-minute presentation followed by a discussion of up to 30 minutes (defence). The time allowed for the written thesis is 24 weeks. If there is an important reason for which the student is not responsible, the Examination Board grants an extension for the duration of that reason. The total possible extension is a maximum of twelve weeks. If extensions in total exceed the maximum extension period, the student may withdraw from the examination.

(2) For the application for admission to the Master's thesis, proof of successfully completed modules totaling at least 45 CP must be submitted to the unit of the Central University Administration responsible for examinations.

(3) The topic of the Master's thesis may be returned once in accordance with Section 60(6) AllgStuPO, but only within the first eight weeks after it has been issued by the unit of the Central University Administration responsible for examinations.

(4) The procedures for applying for admission and for assessing final theses are governed by the AllgStuPO in its currently applicable version.

(5) The final assessment of the Master's thesis takes place after the defence. As a rule, it is carried out within two weeks after submission of the written thesis. In determining the overall grade for the Master's thesis, the averaged grade of the defence counts for 33% and the averaged grade of the written thesis counts for 67%.

(6) If, pursuant to Section 51(3) AllgStuPO, persons experienced in professional practice and training are appointed as examiners for final theses, they must hold at least the degree aimed for in the program or an equivalent degree.

§ 10 - Types of examinations and registration for examinations

(1) The types of examinations and the procedure for registering for module examinations are governed by the AllgStuPO in its currently applicable version.

(2) For modules taken in the compulsory elective area or open elective area that are offered by other faculties or higher education institutions, the examination formats specified in the respective module descriptions apply.

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*) Confirmed by the Executive Board (Presidium) of TU Berlin on 31 March 2026.

Annex 1: Module list[1]

Module		Course	CP	Compulsory / Compulsory elective module	Assessment type	Graded	Weighting in overall grade[2]
A	**Space Technology**		**min. 27**				
	Fundamentals of Space Technology	Fundamentals of Space Technology 1 Fundamentals of Space Technology 2	9	Compulsory module	Portfolio assessment	Yes	1
	Satellite Technology	Satellite Technology	6	Compulsory module	Written examination	Yes	1
	Space Electronics	Space Electronics 1 Space Electronics 2	6	Compulsory module	Portfolio assessment	Yes	1
	Radiation Effects on Space Electronics	Radiation Effects on Space Electronics	3	Compulsory elective module	Written examination	Yes	1
	Spacecraft Dynamics and Control	Spacecraft Dynamics and Control 1 Spacecraft Dynamics and Control 2	9	Compulsory elective module	Written examination	Yes	1
	Spacecraft Propulsion Systems	Spacecraft Propulsion Systems	6	Compulsory elective module	Oral examination	Yes	1
	Space Sensors and Instruments	Space Sensors and Instruments	6	Compulsory elective module	Portfolio assessment	Yes	1
B	**Space System Design**		**min. 15**				
	Space System Design Project	Space System Design Project	9	Compulsory module	Portfolio assessment	Yes	1
	Space Technology Project	Space Technology Project	9	Compulsory elective module	Portfolio assessment	Yes	1
	Planetary Exploration and Space Robotics 1	Planetary Exploration and Space Robotics 1	6	Compulsory elective module	Portfolio assessment	Yes	1
	Planetary Exploration and Space Robotics 2	Planetary Exploration and Space Robotics 2	6	Compulsory elective module	Portfolio assessment	Yes	1
	Space Engineering Focus Project	Space Engineering Focus Project	6	Compulsory elective module	Portfolio assessment	Yes	1
C	**Space Operations**		**min. 12**				

	Space Mission Planning and Operations	Space Mission Planning and Operations	6	Compulsory module	Portfolio assessment	Yes	1
	Human Spaceflight	Technical Aspects of Human Spaceflight Space Psychology	6	Compulsory elective module	Portfolio assessment	Yes	1
	Space Flight Mechanics	Space Flight Mechanics	6	Compulsory elective module	Written examination	Yes	1
	Introduction to Satellite Geodesy	Introduction to Satellite Geodesy	6	Compulsory elective module	Portfolio assessment	Yes	1
D	**Interdisciplinary**		**min. 6**				
	Project Management	Project Management	6	Compulsory elective module	Portfolio assessment	Yes	1
	Innovation Management and Entrepreneurship	Innovation Management and Entrepreneurship	6	Compulsory elective module	Portfolio assessment	Yes	1
	Soft Skills	Soft Skills	3	Compulsory elective module	Portfolio assessment	Yes	1
	German for Engineers A1.1	German for Engineers A1.1	3	Wahlpflichtmodul	Written examination	No	-
	German for Engineers A1.2	German for Engineers A1.2	3	Compulsory elective module	Written examination	No	-
	German for Engineers A2.1	German for Engineers A2.1	3	Compulsory elective module	Written examination	No	-
	German for Engineers A2.2	German for Engineers A2.2	3	Compulsory elective module	Written examination	No	-
Elective modules			**18**				
	Elective module		max. 18	Elective module	see module description		1
	Voluntary internship		6	Elective module	see internship guideline		1
	Total (modules)		**90**				
	Master's thesis		**30**				
	Total		**120**				

[1] The module descriptions are published each semester in the Official Gazette of TU Berlin at the beginning of the winter semester in October and at the beginning of the summer semester in April. The version published there applies (see Section 45(7) AllgStuPO).

[2] The indication “1” means that the grade is weighted according to the scope in CP (Section 68(7) AllgStuPO); “-” means that the grade is not weighted. For further rules on the calculation of the overall grade, see Section 8.

The **compulsory area** comprises 36 CP and is structured into the following areas:

A - Space Technology	21 CP
B - Space System Design	9 CP
C - Space Management and Operation	6 CP

The **compulsory elective area** comprises at least 36 CP and is structured into the following areas:

A - Space Technology	at least 6 CP
B - Space System Design	at least 6 CP
C - Space Management and Operation	at least 6 CP
D - Interdisciplinary	at least 6 CP

Annex 2: Sample study plan

2.1 Start in the summer semester

<table>
<tr><th>1st semester</th><th>2nd semester</th><th>3rd semester</th><th>4th semester</th></tr>
<tr><td rowspan="2">Fundamentals of Space Technology 1
6 CP</td><td>Fundamentals of Space Technology 2
3 CP</td><td rowspan="2">Compulsory elective module
Module group A
6 CP</td><td rowspan="8">Master's thesis
30 CP</td></tr>
<tr><td>Space Electronics 2
3 CP</td></tr>
<tr><td rowspan="2">Satellite Technology
6 CP</td><td rowspan="3">Space System Design Project
9 CP</td><td rowspan="3">Compulsory elective module
Module group B
9 CP</td></tr>
<tr><td>Space Electronics 1
3 CP</td></tr>
<tr><td>Space Mission Planning and Operations
6 CP</td><td>Compulsory elective module
Module group A
6 CP</td><td>Elective module
6 CP</td></tr>
<tr><td rowspan="2">Compulsory elective module
Module group C
6 CP</td><td>Compulsory elective module
Module group D
3 CP</td><td>Compulsory elective module
Module group D
3 CP</td></tr>
<tr><td rowspan="2">Elective module
6 CP</td><td rowspan="2">Elective module
6 CP</td></tr>
<tr><td>Compulsory elective module
Module group D
3 CP</td></tr>
</table>

2.2 Start in the winter semester

<table>
<tr><th>Preparation phase
Aug. – Okt.</th><th>1st semester</th><th>2nd semester</th><th>3rd semester</th><th>4th semester</th></tr>
<tr><td rowspan="2">Satellite Technology
6 CP</td><td>Fundamentals of Space Technology 2
3 CP</td><td rowspan="2">Fundamentals of Space Technology 1
6 CP</td><td rowspan="10">Master's thesis
30 CP</td><td rowspan="2">Compulsory elective module
Module group A
6 CP</td></tr>
<tr><td>Space Electronics 2
3 CP</td></tr>
<tr><td rowspan="8"></td><td rowspan="3">Space System Design Project
9 CP</td><td>Space Mission Planning and Operations
6 CP</td><td rowspan="2">Compulsory elective module
Module group A
6 CP</td></tr>
<tr><td>Space Electronics 1
3 CP</td></tr>
<tr><td rowspan="2">Compulsory elective module
Module group C
6 CP</td><td rowspan="2">Elective module
6 CP</td></tr>
<tr><td rowspan="2">Compulsory elective module
Module group A
6 CP</td></tr>
<tr><td rowspan="2">Compulsory elective module
Module group B
6 CP</td><td rowspan="2">Compulsory elective module
Module group C
6 CP</td><td rowspan="2">Elective module
6 CP</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

A period of study at another higher education institution (mobility window) is generally possible; the program coordination team is available to provide advice. The program can be completed as part-time study. The academic advisory service can assist in creating an individual study plan.