

## **Study and examination regulations for the international continuing full-time Master's Programme in Space Engineering at the Faculty V of Mechanical Engineering and Transport Systems of the Technische Universität Berlin of 09 July 2014**

On the basis of § 18 section 1 no. 1 of the Basic Regulations of the Technische Universität Berlin, § 71 section 1 no. 1 of the Berlin Higher Education Act (Berliner Hochschulgesetz – BerlHG ) dated 26 July 2011 (GVBl. S. 378), the Faculty Council of the Faculty V of Mechanical Engineering and Transport Systems of the Technische Universität Berlin issued the following study regulations on 09 July 2014:

### **Contents**

#### **I. General section**

- § 1 - Applicability
- § 2 - Entry into force

#### **II. Programme objectives and design**

- § 3 - Qualification objectives, contents and professional fields
- § 4 - Start of the programme, standard study period and scope of academic performance
- § 5 - Programme structure

#### **III. Examination procedures and requirements**

- § 6 - Objective of the Master's thesis
- § 7 - Master's degree
- § 8 - Scope of the Master's examination, calculation of the final grade
- § 9 - Examination forms and registration
- § 10- Master's thesis

#### **IV. Appendixes**

- Appendix 1: List of modules
- Appendix 2: Sample degree programme

#### **I. General section**

- § 1 - Applicability

These study and examination regulations govern and specify the objectives and design as well as examination requirements and procedures of the continuing Master's programme in space engineering. It complements the Regulations Governing General Study and Examination Procedures at the Technische Universität Berlin (AllgStuPO) with discipline-specific regulations.

- § 2 - Entry into force

(1) These study regulations enter into force on the day after their publication in the Amtliches Mitteilungsblatt der Technischen Universität Berlin.

#### **II. Programme objectives and design**

- § 3 - Qualification objectives, contents and professional fields

Building on the qualifications required for admission, the programme prepares students for a qualified professional activity in the field of space technology. The study of complex systems and technologies in astronautics plays a big role here. Students have to acquire in particular space-related system expertise exceeding technical specialization. Thus, students will acquire:

- Professional expertise in the field of space technology
- Methodical competence in engineering-oriented approaches
- Social skills in intercultural und interdisciplinary communication
- Technical competence for solving complex technical problems

The students of the programme will be able to start their career in international space companies and organizations. By putting emphasis on the methodical and analytical aspects of the study, the students will also be given the opportunity to work in related industries such as mechanical engineering, electrical engineering or vehicle construction.

Due to technological progress and high activity in small satellites research the use of outer space is growing, which represents an increasing threat of space debris. In view of this tendency, it is especially important for astronautical engineers to embrace the concepts of socially responsible conduct and sustainable development. Therefore, topics in the context of space debris prevention enjoy high priority within the programme, especially under the headings „Space Debris Mitigation“ and „Clean Space“. Collaboration with experts from research organizations working on these subjects but also course-related projects on space debris prevention technologies should enhance the awareness of students about the problem.

- § 4 - Start of the programme, standard study period and scope of academic performance

- (1) The programme starts in the summer semester.
- (2) The standard study period is four semesters, including the completion of the Master's thesis.
- (3) The Master's programme comprises 120 credit points in total.
- (4) The curriculum and all the examination procedures are designed and organized in such a way that the course of studies can be completed within the standard study period.

- § 5 - Programme structure

(1) Students have the right to individually organize their study plan. However, they are obliged to observe the guidelines of these study and examination regulations. The recommended succession of modules can be found

in the sample degree programme, Appendix 2. This does not affect constraints defined by the discipline-specific requirements for admission to modules.

(2) In the master's programme, evidence of a study and examination performance totalling 120 credit points (CP) has to be provided, comprising 90 CP in modules and 30 CP in the Master's thesis.

(3) Of the required courses, modules totalling 33 CP are taken as follows:

A - Space Technology	18 CP
B - Space System Design	9 CP
C - Space Management and Operation	6 CP

(4) Of the elective courses, modules totalling 57 CP are taken as follows:

A - Space Technology	min. 6 CP
B - Space System Design	min. 9 CP
C - Space Management and Operation	min. 6 CP
D - Interdisciplinary	min. 6 CP

Modules, divided up into particular field areas, can be found in the list of modules, Appendix 1.

### III. Examination procedures and requirements

#### § 6 - Objective of the Master's thesis

The Master's thesis should show that the candidate has reached the qualification objectives described in § 3 of these regulations.

#### § 7 - Master's degree

Upon passing the Master's examination, the candidate is conferred the Master of Space Engineering degree by the Technische Universität Berlin, the Faculty V of Mechanical Engineering and Transport Systems.

#### § 8 - Scope of the Master's examination, calculation of the final grade

(1) The Master's examination consists of module examinations included in the list of modules, Appendix 1, as well as the Master's thesis (§ 10).

(2) The final grade is calculated according to the principles in § 47 section 6 of the AllgStuPO from graded module examinations included in the list of modules that are part of the final grade. Completed modules assessed as worst comprising 18 credit points in total are not regarded. Of these, at least 6 credit points have to belong to the field areas A, B and C as well as at least 6 credit points have to belong to the field area D.

#### § 9 - Examination forms and registration

(1) Examination forms as well as the procedure for admission to module examinations is governed by the current version of the AllgStuPO. Service modules offered by other faculties are approved regardless of their examination forms.

(2) The study and examination language is English. Classes can be offered and assessed in German if it is ensured that the programme with alternative lectures can be finished fully in English. At the request of the student to be examined, English shall be provided as the language of examination.

#### § 10 - Master's thesis

(1) As a rule, the Master's thesis should be completed in the fourth semester of study. It comprises 30 CP and should be completed within 24 weeks. In exceptional cases the chairman of the examination board may extend the time allowed for the Master's thesis by up to one month (in the event of illness- up to three months). The examination board decides on further special regulations.

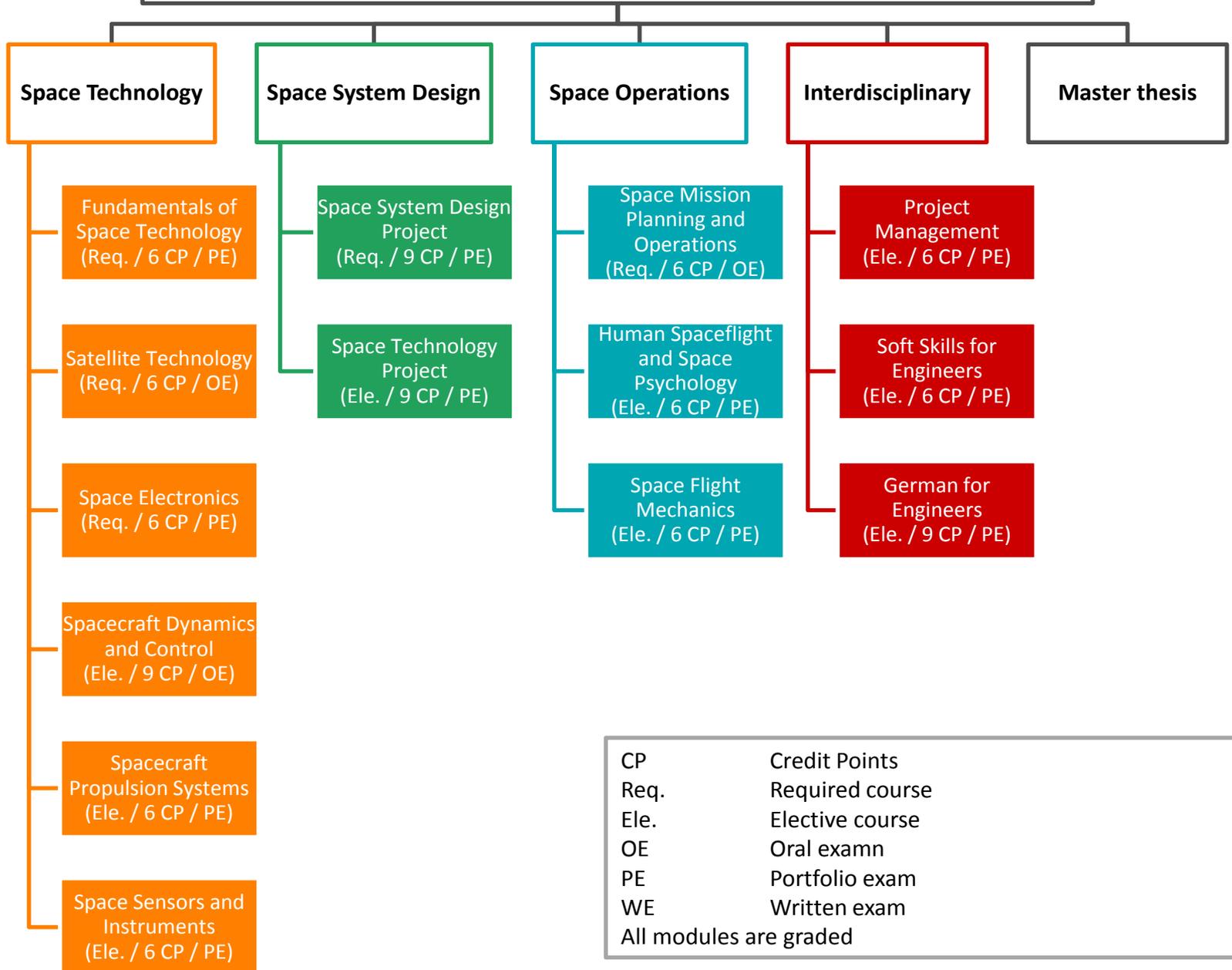
(2) The application for admission to the Master's thesis must provide proof of the fulfilment of module examinations comprising at least 60 CP to the competent body.

(3) The topic of the Master's thesis can be changed once, however, only within the first eight weeks after its official appointment by the competent body of the central university administration.

(4) The procedures for the application for admission as well as the evaluation of final examinations are governed by the current version of the AllgStuPO.

# Space Engineering study programme at TU Berlin

## Module overview



	Module group	Assigned modules	Req. / Ele.	Credit Points	Sem.1 SPW (CP)	Sem. 2 SPW (CP)	Sem. 3 SPW (CP)	Sem. 4 SPW (CP)
<b>A</b>	<b>Space Technology</b>			<b>min. 24</b>				
		Fundamentals of Space Technology	Req.	6	4 (6)			
		Satellite Technology	Req.	6	4 (6)			
		Space Electronics	Req.	6		4 (6)		
		Spacecraft Dynamics and Control	Ele.	9		4 (9)		
		Spacecraft Propulsion Systems	Ele.	6			4 (6)	
		Space Sensors and Instruments	Ele.	6			4 (6)	
<b>B</b>	<b>Space System Design</b>			<b>min. 9</b>				
		Space System Design Project	Req.	9		4 (9)		
		Space Technology Project	Ele.	9			4 (9)	
<b>C</b>	<b>Space Operations</b>			<b>min. 9</b>				
		Space Mission Planning and Operations	Req.	6	4 (6)			
		Human Spaceflight and Space Psychology	Ele.	6		4 (6 LP)		
		Space Flight Mechanics	Ele.	6	4 (6)			
<b>D</b>	<b>Interdisciplinary</b>			<b>min. 9</b>				
		Project Management	Ele.	6	X			
		Soft Skills for Engineers	Ele.	6			4 (6)	
		German for Engineers	Ele.	9	2 (3)	2 (3)	2 (3)	
	<b>Total (modules only)</b>			<b>90</b>	18 (27)	18 (33)	18 (30)	0 (0)
	<b>Master thesis</b>			<b>30</b>				(30)
	<b>Total</b>			<b>120</b>	18 (27)	18 (33)	18 (30)	(30)

CP Credit Points  
 Req. Required course  
 Ele. Elective course  
 SPW Semester periods per week  
 Sem. Semester  
 min. minimum  
 X Course not selected

The study programme can also be completed on a part-time basis. For the development of an individual study plan, information centers at TU Berlin can be consulted.