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Note: The following statute is considered to be in draft form until publication of the URL in the university news publication MSGJFS

**Statute of the Department of Applied Natural Sciences of the Lübeck University of Applied Sciences and the University of Lübeck in regard to the course of study and examinations of the international master study program Biomedical Engineering– Study and Examination Regulations (SPO) Master Study Program Biomedical Engineering – as of July 28, 2017**

NBl. HS MSGJFS Schl.-H. 2017, S. ...

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On the basis of § 52 section 2 i. V. m. section 10 of the Higher Education Act (HSG) in the published version from February 5, 2016 (GVOBl. Schl.-H. S. 39), last amended by Article 1 of the act on March 14, 2017 (GVOBl. Schl.-H. 2017, S. 142), the subsequent statute will be adopted following the decision of the convention of the Department of Applied Natural Sciences on July 3, 2017, in accordance with the declaration of the Senate on July 12, 2017 and with the approval of the committee of the Lübeck University of Applied Sciences on July 27, 2017:

## **Section I – General Section**

### **§ 1**

#### **Scope**

These Study and Examination Regulations regulate the objectives and design of the study program, as well as the requirements and implementation of examinations of the joint international master study program Biomedical Engineering at the Lübeck University of Applied Sciences and the University of Lübeck. This complements the procedure of examination regulation (PVO) of the Lübeck University of Applied Sciences with study-specific regulations.

### **§ 2**

#### **Course of Studies**

The master’s examination of the course of study, Biomedical Engineering, constitutes a further professional degree, based on the successful completion of a first-degree or undergraduate course of studies. The purpose of the examination is to demonstrate a high technical knowledge at a scholarly level, to demonstrate whether students are able to identify connections within the field of study, to apply scientific methods and knowledge of medical technology, and use the basic, subject-specific and interdisciplinary knowledge competently and in a goal-oriented manor in both theory and practice.

**§ 3**  
**Degree Designation**

Upon the successful completion of the master degree program, the academic degree “Master of Science” (M.Sc), as a secondary professional degree, is jointly awarded by the Lübeck University of Applied Sciences and the University of Lübeck.

**Section II– Organization of the Examination System**

**§ 4**  
**Examination Committee**

(1) For the organization of the examinations and the assignments assigned through this examination regulation, an Examination Committee shall be established, composed as follows:

1. Four members from the group of professors
2. Two members from the group of academic or non-academic staff
3. One member from the group of students.

The members of the Examination Committee as well as their representatives are elected jointly by the committee of the course of study. The term of office of the university professor as well as the academic or non-academic staff member is two years. The student remains in office for one year. Re-election is permitted. If no member of the academic or student groups is elected, the position remains unoccupied. If necessary, the committee of the course of study may replace a member for the rest of the term with a new member.

(2) The members of the Examination Committee elect from among their members a Chairperson as well as a proxy from the group of professors.

(3) The Examination Committee shall be deemed to be valid, if at least two other professors and two other voting members are present in addition to the Chairperson or their proxy. The committee shall act through a simple majority of votes cast. Abstention from voting or invalid votes shall be considered as non-votes (§15 HSG). In the event of a tie, the proposal is deemed to be rejected.

(4) The meetings of the Examination Committee are not public.

(5) The members of the Examination Committee are subject to confidentiality. Provided that they are not members of public service for the Lübeck University of Applied Sciences or the University of Lübeck, they are bound to confidentiality by the Chairperson.

(6) The members of the Examination Committee have the right to attend examinations.

(7) In particular, the Examination Committee shall ensure compliance with the procedure of examination regulation. It shall ensure the proper execution of exams. It shall make decisions on the final passing or non-passing Bachelor’s or Master’s examination. It shall make decisions on the objection to an examination outcome. It shall provide proposals for reform of the procedure of examination regulation as well as the study specific examination regulations.

(8) The day-to-day activities of the committee will be exercised by the Chairperson of the Examination Committee. The Examination Committee shall ensure compliance with the provisions of the examination regulation. It shall report regularly to the joint committee on developments of the examinations and periods of study, including the actual working time of the master thesis as well as the allocation of the subject-specific and overall scores. The Examination Committee shall provide proposals for the reform of the study plan and the examination regulations.

## **§ 5**

### **Appointment and Designation of the Examiners and Assessors**

(1) The respective Examination Committee shall appoint the examiners. It may delegate this appointment to the Chairperson.

(2) Only university lecturers and full-time staff or those who hold regular lectures at the Lübeck University of Applied Sciences or University of Lübeck may be appointed as examiners. Provided valid reasons, the Examination Committee may also appoint other persons as examiners, provided that for master courses they hold at least a Master's degree or equivalent qualification in the relevant or related field or subject area.

(3) Only persons who have passed the final examination in the respective course of study or a comparable examination may be appointed as expert assessors. Expert assessors oversee the proper conduct of the examination and have no decision-making authority.

(4) Persons for which there is a justified basis for impartiality in evaluation may not be appointed as examiners. The candidate for examiner must inform the Examination Committee responsible for appointing examiners immediately of any grounds for bias known to them.

(5) § 4 section 6 applies accordingly to the examiners or assessors.

## **Section III – Objectives and Structure of Studies**

### **§ 6**

#### **Qualification Objectives, Content and Occupational Fields of Activity**

(1) The graduates know the fundamental technical methods and approaches of medical technology and are able to apply them with certainty. They are familiar with the core competences of medical technology, such as the essential devices for diagnostics or therapy, the specifics of the development of these devices and the interaction of these devices with humans, but are also familiar with the fundamentals of the regulatory aspects of medical products.

(2) The graduates are able to analyze fundamental problems in the field of medical technology and solve them in a goal-oriented manner, as well as structure the technical contents and present them verbally and in writing in an appropriate form. They possess the ability to think and act scientifically, to make critical judgments, to conduct themselves responsibly, as well as to communicate and cooperate. They possess a high intercultural competence.

(3) The graduates have acquired basic knowledge and skills in the field of medical technology. Important technical contents are the analysis of problems and the implementation of the solution strategies which

are of great importance for professional activities in an increasingly technologically-oriented medical society. The self-organization of teams is learned through projects while presentation skills are practiced and reinforced through seminars as well as the Student Conference.

(4) The job description of a medical engineer is very broad with regard to the sector, size of the company and the specific field of work. However, the majority is active in the development of medical products, whereby working independently, with abstract thinking and creativity, as well as the ability to work in teams and good communication skills make up important prerequisites. The Biomedical Engineering Master's Program supports these skills through projects and therefore prepares the graduates for the aforementioned tasks. Furthermore, the graduates are qualified to pursue a further doctoral project.

## **§ 7**

### **Admission Requirements**

(1) Admission requirements for this master's program are as follows:

#### **1. Degree:**

a) A primary university degree qualifying one for professional employment with at least 180 ECTS credit points (LP) in the subject area of electrical engineering, computer science, mechanical engineering, mechatronics, medical engineering, physical engineering, process engineering or material engineering and an overall grade of at least 2,5

b) or a primary university degree qualifying for professional employment from a "Universität", "Hochschule", "Fachhochschule" or equivalent institute of higher education within the scope of the Higher Education Framework Act in the subject area of electrical engineering, computer science, mechanical engineering, mechatronics, medical engineering, physical engineering, process engineering, material engineering or a comparable study program and an overall grade of at least 2,5. Bachelor's study programs must be accredited.

c) The decision for admission of graduates of study programs other than the aforementioned subject areas in engineering sciences will be decided upon application.

#### **2. Language**

Good English language proficiency must already exist, in order to be able to follow the lectures held in the English language. The following serves as proof:

a) Proof of good English language proficiency up to a B2 level according to the Common European Framework:

aa) TOEFL-Test

bb) or a comparable internationally recognized English test, which provides proof of the corresponding language level,

b) or proof through the fulfillment of at least one of the following criteria:

aa) English was the official language of the school education,

- bb) at least six months of study or work in an English speaking country,
- cc) English was the official language of the course of studies which qualifies the applicant for the Biomedical Engineering Master's degree program.

In the case of doubt, the Examination Committee shall decide on the proof of language qualification.

(2) Admission to the study program is decided on the basis of the overall grade, the proof of English language proficiency, the duration and contents of the first degree program as well as the citizenship of the applicants through an internal university selection procedure, which is jointly agreed upon by the Study Committee.

(3) Admission is to be denied if the applicant did not successfully pass the master examination of the Biomedical Engineering study program or a related study program at a university within the scope of the Higher Education Framework Act or if they are part of an examination procedure of this study program at another university.

(4) Students cannot be simultaneously enrolled in the Bachelor's study program "Biomedizintechnik" of the Lübeck University of Applied Sciences or "Medizinische Ingenieurwissenschaft" of the University of Lübeck and the joint Master's study program "Biomedical Engineering" of the Lübeck University of Applied Sciences and the University of Lübeck.

## **§ 8**

### **Study Objectives, Commencement of Studies, Regular Study Period, Scope, Structure, and Content**

(1) Application-oriented teaching is intended to provide a foundation based on scientific education which enables independence within the profession. Through the course of studies, students should acquire the ability to think and behave on a scientific basis. They should be familiar with, be able to independently apply and further develop the appropriate methods and expertise of medical technology throughout the entire product lifecycle of a medical device.

(2) The course of studies commences in the Winter Semester.

(3) The regular study period comprises four semesters.

(4) The scope of the study program comprises 120 ECTS credit points (LP).

(5) Students, with a primary university degree qualifying for professional employment in the areas of electrical engineering, information technology, mechanical engineering, physics, process engineering, material science or an equivalent, complete 48 weekly hours per semester (SWS) with their studies (Group I).

(6) Students, with a primary university degree qualifying for professional employment in the areas of biomedical engineering, medical technology, or an equivalent, complete 50 weekly hours per semester (SWS) with their studies (Group II).

(7) The course of studies is divided into:

	Semester	Weekly hours/ semester (SWS)	ECTS Credit Points
Compulsory Modules	1-2	38/40	50
Compulsory Elective Modules	2	8	10
Elective Modules	2	2	3
Research Internship	3		20
Student Conference	3		5
Master Thesis	4		30
Master Colloquium	4		2
Total:			120

(8) The course of studies includes the specified modules in Appendix 1, for which the students must verify the examination and study performances, for the successful graduation from the degree program.

(9) The selected compulsory elective modules must comprise 8 hours per week (SWS). The selection catalog is listed in Appendix 1.

(10) The elective module can be selected freely from the courses offered by the Lübeck University of Applied Sciences, the University of Lübeck or another University comprising 2 hours per week (SWS) or 3 LP. No module may be assigned twice. No module may be assigned that is identical in content to a module from another course of studies. The selected modules must be modules from a master's study program.

## § 9 Courses

(1) The achievement of the respective learning outcomes is supported through different forms of teaching and learning. In particular, the Lübeck University of Applied Sciences will offer the following types of courses:

Type of Course	Content of Course
Lectures (V)	Teaching of course material
Exercises (Ü)	Processing and deepening of the course material with the chance for discussion.
Practical Courses (Pr)	Small-group practical (Laboratory) activities within the university
Projects (Pj)	Working on project tasks
Seminars (S)	Working on selected subjects
Excursions (E)	Study excursions as an introduction into the professional world, with presentations by the participants and discussion where necessary.

(2) The subject matter and the applicable type of course, as well as the duration, scope, number and time are provided in Appendix 1 of these Study and Examination Regulations.

(3) The Dean's office may authorize the courses to be held in total or in part as online courses.

**§ 10**  
**Restriction to Participation**

- (1) If the number of students exceeds the course capacity, the department may restrict the number of participants if:
1. The number of applicants exceeds the capacity of a course,
  2. despite an exhaustive use of the instructional capabilities necessary for the proper implementation of the course, and
  3. the students are permitted to participate in a corresponding course in the same semester or in the case of compelling reasons, in the following semester.
- (2) When restricting the number of participants, the following measures are taken into account:
1. The number of participants in a course may only be restricted if and insofar as it is absolutely necessary with regard to the instructional capabilities of an organized teaching and learning environment (on the basis of capacity).
  2. Courses in terms of sentence 1 are such courses which are obligatory in the Study and Examination Regulations of the course of studies.
  3. The determination of the maximum number of participants for the respective course is carried out by the department.
  4. The determination of a maximum number of participants is university-wide and is announced appropriately.
- (3) Provided that no sufficient course offerings can be made available through parallel courses, admission into the participant-limited courses takes place in the following order:
1. Students who are involuntarily behind in their studies (e.g. due to non-admission in the previous semester, illness, pregnancy), are given priority in the admission to a participant-limited course.
  2. Further selection is made according to necessity of the course for the further progression of the student's course of study.
  3. Secondarily permitted students are those which were previously admitted to the course at an earlier date, however did not attend the course in its entirety, including all performance reviews, without sufficient excuse.
- (4) In the case of applicants with equal rank, the outcome will be decided by means of a draw.
- (5) Admission into compulsory courses can only be made dependent on prior knowledge from previous courses, if the Study and Examination Regulations provide for this.
- (6) The following are not permissible as selection criteria for restriction to participation:

1. The selection of students according to the grade of specific previous achievements.
2. The implementation of entrance examinations for courses. This shall not include the provision of necessary achievements, which are produced in Appendix 1.

**§ 11**  
**Compulsory Attendance**

- (1) Compulsory student attendance shall not be regulated as a prerequisite for participation in study and examination performances, unless the course is an excursion, language course, practical course, practical exercise or comparable course.
- (2) If compulsory attendance is a prerequisite for participation in study and examination performances of courses, it is shown in Appendix 1.
- (3) The details of the final thesis and final colloquium are regulated by the directive determined by the department.

**Section IV – Study and Examination Performances, Examination Methods**

**§ 12**  
**Study Performances**

- (1) Study performances are usually evaluated as "pass" or "fail" but may also be graded.
- (2) Study performances are given during the semester and may consist of several partial study performances and are not included in the calculation of module grades.
- (3) Study performances may be repeated indefinitely.

**§ 13**  
**Examination Performances**

- (1) Examination performances are possible as either an end-of-module examination or partial-module examination.
- (2) End-of-module examinations evaluate all components of a module through a test. The assigned grade is the module grade.
- (3) Partial-module examinations evaluate one or more components of a module. After completion of all partial-module examinations, the assigned module grade is determined from the defined weighting of the partial-module grades.



## **§ 14**

### **Thesis**

- (1) Admission to the thesis is decided by the Chairperson of the Examination Committee. He or she may make the admission subject to the provision that the student provides individual proofs of the technical admission requirements no later than one week prior to the start of the thesis.
- (2) The thesis may be supervised by any professor, university lecturer or private lecturer with a permanent employment contract with the Lübeck University of Applied Sciences or the University of Lübeck, who is working in research and teaching of medical technology. The student is given the opportunity to make proposals for the thesis topic. The date of issuance of the thesis must be recorded.
- (3) If the thesis is conducted outside of the Lübeck University of Applied Sciences or the University of Lübeck, it requires the approval of the Chairperson of the Examination Committee. This is to be submitted in the form of an approximately one-page task description, which is agreed upon by the thesis supervisor.

## **Section V – Requirements and Implementation of Examinations**

### **§ 11**

#### **Thesis und Final Colloquium**

- (1) The master thesis is usually completed in the fourth study semester. It has a scope of 30 LP with a working period of 6 months
- (2) The final colloquium is conducted as an oral examination and has a scope of 2 LP. The duration is at least 30 minutes and at most 60 minutes. Therefore the presentation of the thesis should not exceed 15 minutes.

### **§ 12**

#### **Prerequisites and Admission**

- (1) Study performances are authorized for:
1. one who is enrolled in the master's program Biomedical Engineering
  2. and has fulfilled the accompanying study and examination performances.
- (2) Examination performances are authorized for:
1. one who is enrolled in the master's program Biomedical Engineering
  2. and has fulfilled the accompanying study and examination performances.
- (3) Admission to the study and examination performances is decided by the examiner and in the case of doubt, by the Examination Committee. The permission will be given in an appropriate manner.
- (4) Permission is denied if the admission prerequisites are not fulfilled.
- (5) Prerequisite for admission to the master thesis is the proof of all of the study and examination performances provided within the Module plan of these Study and Examination Regulations up to the

end of the first semester, at least 20 LP from the second semester as well as the successfully completed research internship.

(6) Prerequisite for admission to the final oral examination (colloquium) is the proof of all of the performances provided within the Module plan of these Study and Examination Regulations and the “passed” master thesis.

### **§ 13 Registration**

(1) Students must register themselves for all study and examination performances within the time-limit and in the prescribed manner.

(2) Registration for examination performances is done electronically via the registration portal provided by the university.

(3) Registration for the end-of-semester examination performances is usually done at the end of the semester. Registration for the re-examination of these examination performances is done in the following semester during the lecture-free period.

(4) Registration for the study performances and examination performances held during the semester are in each case usually done at the beginning of a semester.

(5) Registration periods are announced in an appropriate manner by the study program coordinator.

(6) Registration for the thesis as well as the final colloquium is done exclusively through the faculty secretariat.

### **§ 14 Examination Procedure**

The examination procedure is set in place by the Examination Procedure Regulation (PVO) of the Lübeck University of Applied Sciences, unless otherwise stipulated in these Study and Examination Regulations.

### **§ 15 Language of Examination**

The examinations will usually be given in the English language. In justified exceptional cases, at the request of the student, the Chairperson of the Examination Committee may decide that the examination performances may also be given in the German language.

### **§ 16 Research Internship**

(1) Through the research internship students of the master study program Biomedical Engineering are given the opportunity to acquire practical experience in the application of research methods within prospective fields of work. It serves as proof of engineering practice in the area of medical technology.

(2) The duration of the research internship is at least 16 full-time work weeks. It can be completed in a maximum of two sections, each being 8 full-time work weeks.

(3) Students must register themselves for the research internship within the time-limit and in the prescribed manner. Registration is done via a form through the faculty secretariat. The Examination Committee must approve the planned content of the research internship.

(4) Details of the topic and style of the research internship are regulated by the guidelines as determined by the Study Program Committee.

### **§ 17**

#### **Assessment, Weighting, and Composition of the Overall Grade**

(1) If modules consist of several partial-module examinations, each individual partial-module examination must be evaluated with at least "sufficient" (4.0), in order for the Module to be counted as passed.

(2) Within a module, the final module grade and partial-module grade are weighted by means of the assigned SWS. The relevant SWS weightings are given in Appendix 1.

(3) The module grades, the grade of the master thesis as well as the grade of the colloquium are weighted via the assigned LP for the composition of the overall grade. The relevant LP weightings are given in Appendix 1.

### **§ 18**

#### **Notification of Assessment**

The person responsible for data processing for the responsible department is to be notified about the assessment of the study performance within a period of four weeks.

### **§ 19**

#### **Final Clause**

This statute comes into effect beginning September 1, 2017 and applies to all students newly enrolled from the Winter Semester 2017/2018.

*Lübeck, July 28, 2017*

*Prof. Dr. Stephan Klein  
Chairperson of the Joint Committees for Biomedical Engineering*