

OTTO VON GUERICKE UNIVERSITY MAGDEBURG

Faculty of Mechanical Engineering



Program-Specific Study and Examination Regulations
for the

**Master's study program in
Biomechanical Engineering
(M-BiME)**

dated
29.11.2023

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On the basis of §§ 13 paragraph 1 sentence 1, 67a paragraph 2 no. 3a of the Saxony-Anhalt Higher Education Act as published in the announcement dated 01 July 2021 (Law & Ordinance Gazette LSA pp. 368, 369), Otto von Guericke University Magdeburg has enacted the following program-specific Study and Examination Regulations as a statute, which is a binding supplement to the General Study and Examination Regulations (aSPO) for the Master's study programs offered by the faculties participating in the Engineering Campus of Otto von Guericke University Magdeburg:

I. General Section

§ 1 Scope

(3) These program-specific Study & Examination Regulations for the Master's study program in Biomechanical Engineering (M-BiME) supplement (S) and/or flesh out (F) the applicable version of the General Study and Examination Regulations (aSPO) for the Master's degree programs offered by the faculties participating in the Engineering Campus of Otto von Guericke University Magdeburg as follows:

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Appendix 1: Study and examination schedule

§ 2

Program-specific educational objectives

(4) S Graduates should acquire a broad but simultaneously detailed and critical understanding of the specialist knowledge required to achieve the general aims of an engineering study program as well as develop the personal skills to enable them to work independently in accordance with scientific methods, familiarize themselves independently with the diverse activities relating to application, research and teaching and be able to cope with the frequently changing array of tasks.

The objective is to develop specialist and methodological skills that permit a holistic view of biomedical and technical contexts based on sound fundamental knowledge and, through life-long learning, ensure new and in-depth knowledge can be acquired quickly.

The combination of knowledge from the fields of mechanical engineering, medicine, biology and kinesiology is used in the transfer of engineering principles and fundamentals to biological systems in order to develop mechanically dominated medical devices holistically that are adapted to current challenges. The curriculum facilitates the development of both specific and interface skills in the fields of construction and materials science as well as medicine and product legislation.

The range of specialization profiles facilitates a scientific education in the fields of orthoses and implants, which, through the connecting compulsory modules covers the entire spectrum of the increasing demands placed upon sustainable medical devices, from installation and adaptation to the targeted evolution of biomechanical systems in or on the body.

Students will acquire the skills to enable them to critically examine opinions in their subject area, to solve problems as they arise in a scientifically structured way taking into account neighboring disciplines, and to represent their solution / communicate their knowledge to their peers as well as lay persons. They will be in a position to creatively develop their subject area beyond the current state of the art and to acquire new knowledge for themselves. Graduates will also be able to reach scientifically substantiated decisions on the basis of limited information, and in the process take societal and ethical insights into account. They will be in a position to take on responsibility within a team.

(5) S: During their studies, graduates will have obtained the social and legal competences that enable them:

- to communicate about the content and problems of biomechanical medical devices and their related disciplines with experts,
- to execute projects,
- to work individually and as integrated members of international groups,
- to take on leadership responsibilities and
- to act in a committed, goal-oriented, task-based and ready-to-learn way in various professional fields.

(6) S: Graduates of the program are prepared for professional life through its ample practical relevance and are aware of their social and ethical responsibility with regard to their own actions.

II. Scope and Progression of Course

§ 4

Admission Requirements

(2) b) F: The completed degree must include (in accordance with ECTS)

- at least 10 CP in mathematics,
- 15 CP in mechanical engineering fundamentals,
- 5 CP in materials science fundamentals,
- 10 CP in natural science fundamentals.

(3) F: Candidates' aptitude will be determined on the basis of the results of the degree examination in accordance with § 4 para 2a aSPO-M and requires the previous course of studies to have been completed with an overall grade of at least 2.500.

(4) F: Notwithstanding paragraph 3, applicants will be assumed to meet the aptitude requirement if at the time of their application they do not yet hold a qualifying Bachelor's degree but require no more than a further 30 CP until that degree has been successfully completed and of the number of CP attained, the average grade calculated from the available examination results is at least 2.500.

Applicants without evidence of a first professional degree will be enrolled temporarily and conditionally. The "Regulation governing the organization of the application and admission process for Master's degree programs" at OVGU Magdeburg (as amended) applies.

(6) F: Applicants for this predominantly English-language Master's study program must be able to demonstrate adequate knowledge of the English language at level C1 in accordance with the Common European Framework of Reference for Languages. Students may apply for a determination of equivalence from the board of examiners.

(8) F: Admission in accordance with § 4 para. 2 b is only permissible if no more than a total of 15 CP are lacking in the required areas of competence. Admission may then be subject to appropriate conditions.

(12) F:

a) Further admission requirements:

In accordance with § 20 para. 9 of the Prevention of Infection Act (IfSG), all applicants must be adequately immunized against measles. Evidence of this must be provided upon application by way of

- an officially authenticated certificate of immunization in German or English (e.g., vaccination record or certificate), providing information about the level of protection against measles and stating the holder's name, date of birth and date of vaccination or
- through a doctor's attestation that the candidate has received sufficient protection against measles in accordance with their age (in line with the requirements pursuant to § 20 para. 9 of the Prevention of Infection Act (IfSG). This comprises two measles vaccinations for individuals over two years of age or a serological laboratory test that attests to the holder's immunity against measles or
- a doctor's certificate that certifies the holder's exemption from a measles vaccination on the basis of a long-term medical contraindication.

b) Selection process:

To take into account the particular requirements of the study program, the preceding program of study must – subject to para. 4 – in accordance with § 4 para. 2a of the aSPO for the Master's programs offered by the faculties participating in the Engineering Campus of Otto von Guericke University Magdeburg, have been completed and the candidate must have successfully participated in the program-specific internal selection process at the university.

Only those candidates who have attained a ranking in the ranking list that is sufficient in keeping with the available study places shall be deemed to have been successful in the selection process. The process and the evaluation criteria for the selection decision are set out in the statute concerning the implementation of the in-house selection process for the Master's program in Biomechanical Engineering.

§ 5

Commencement and Duration of Studies

(1) F: Enrollment is possible in the winter semester. The enrolling faculty is the Faculty of Mechanical Engineering.

(2) F: The standard study duration for the Master's study program in Biomechanical Engineering is 4 semesters, including the Master's thesis.

§ 6

Organization and Scope of Studies

(5) F: To successfully complete the Master's program in Biomechanical Engineering, a total of 120 credit points must be obtained.

To this end, a certain number of compulsory and compulsory elective modules must be successfully completed. It is also possible for the student to complete additional modules of his or her choice.

Details of the modules and the allocation of CPs can be found in Appendix 1.

§ 7

Program Structure

(3) F: By selecting a specialization (20 CP) and further modules (15 CP) from the compulsory elective area, students of the Master's program in Biomechanical Engineering are able to follow their individual inclinations and interests and/or to take into account specialist requirements of their future area of employment. The list of compulsory elective modules may be amended in accordance with developments in the disciplines taught and the availability of teaching staff. Information on this can be found in the module handbook and/or, if available, the module catalog.

(7) S: The schedule detailed in the Appendix for the completion of modules and module examinations ensures that the program is completed within the standard study duration.

IV. Master's Degree

§ 22

Admission to the Master's Thesis and Issuing of the Topic

(1) Only students who are enrolled at Otto Guericke University on the Master's program in Biomechanical Engineering, who can demonstrate that they have obtained at least 75 CP from the compulsory and compulsory elective parts of the course and who have completed the interdisciplinary project module with 5 CP shall be permitted to register for their Master's thesis.

V. Final Provisions

§ 34

Validity/ Transitional Arrangements

These regulations apply to all students enrolling in this program from the winter semester 2024. Students who were already enrolled on the course before 01.10.2024 may apply to accede to these regulations. This may not be revoked.

§ 35

Entry into force

These program-specific Study and Examination Regulations for the Master's program in Biomechanical Engineering will enter into force following their publication in the Official Announcements of Otto von Guericke University.

Issued by virtue of the resolution of the Faculty Council of the Faculty of Mechanical Engineering dated 01.11.2023 and the statement of the Senate of Otto Guericke University dated 13.12.2023.

Magdeburg, 19.12.2023

Prof. Dr.-Ing. habil. Dr. hc. Jens Strackeljahn
President
of Otto von Guericke University Magdeburg

Appendix 1: Study and examination schedule

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Master's study program Biomechanical Engineering		CP	1st sem.	2nd sem.	3rd sem.	4th sem.
			WiSe	SuSe	WiSe	SuSe
Compulsory area						
Anatomy for Engineering Students		5	E/A			
Biomechanical Sensors		5	E/A			
Orthopedic Technology		5	E/A			
Applied Biomechanics		5	E/A			
Applied Engineering Design		5	E/A			
Biomedical Materials I		5	E/A			
Biomedical Materials II		5		E/A		
Clinical Biomechanics		5		E/A		
Medical Device Regulation and Ethics in Medicine		10				
Part I: Introduction to the approval process of medical devices		(5)		E/A		
Part II: History and Ethics of Medicine and Medical Engineering		(5)			E/A	
Specialization area						
Specialization Exoprosthetics	Module 1	5		E/A		
	Module 2	5		E/A		
	Module 3	5			E/A	
	Module 4	5			E/A	
Specialization Endoprosthetics	Module 1	5				
	Module 2	5				
	Module 3	5				
	Module 4	5				
Compulsory elective area						
Module 1		5		E/A		
Module 2		5			E/A	
Module 3		5			E/A	
Project area						
Interdisciplinary Project		5			E/A	
Master's thesis incl. colloquium		30				E/A
Total in CP per semester			30	30	30	30

CP – Credit points in accordance with ECTS

E/A – examination/assessment in accordance with §14 para. 1 aSPO–Master's as per the module description

The study and examination schedule shown is an example. In accordance with the chosen area of specialization and the semester schedule of individual compulsory elective modules, there may be adjustments within the study and examination schedule. Module descriptions can be found in the module handbook (MHB). The module handbook (MHB) contains further details.

As per §14 (11) of the General Study and Examination Regulations, for each module the module coordinator may specify pre-examination requirements that are necessary pre-conditions for the awarding of CP.