

## **UNOFFICIAL TRANSLATION**

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This is a translation of the Examination Regulations of the master's program Microsystemtechnik that were passed (in German) by the University of Freiburg Senate in its meeting on August 19, 2005 (Official Bulletins, Volume 36, No. 46, pp. 269-293) and adapted on December 17, 2018 (Official Bulletins, Volume 49, No. 64, pp. 489-516) – with amendments

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### **Examination regulations for the Master of Science (M.Sc.) program**

#### **Appendix B. Subject-specific regulations for the examination regulations Master of Science (M.Sc.)**

#### **Mikrosystemtechnik**

##### **§ 1 Program profile**

- (1) The master's program in Mikrosystemtechnik is research-oriented and consecutive.
- (2) The master's program in Mikrosystemtechnik, which is mainly taught in German, is aimed in particular at graduates of bachelor's programs in engineering and natural sciences with a focus on microsystems engineering. Based on a compulsory programme of elementary basics, the master's program provides students with in-depth knowledge in the areas of circuits and systems as well as materials and fabrication and in various applications of microsystems technology, in particular biomedical engineering and photonics, depending on their individual focus. Students have the option of choosing one of the four above-mentioned areas as a specialization, which is shown in the degree certificate. Students are enabled to research, develop and apply microsystems technology solutions in their future engineering career. The successful completion of the master's program qualifies students for an academic career in the field of research and development as well as for a career in industry, in research organizations or with state authorities.

##### **§ 2 Program entry and scope**

- (1) The Master's program in Mikrosystemtechnik can be entered in the winter semester and in the summer semester.
- (2) The Master's degree program in Mikrosystemtechnik consists of coursework equivalent to 120 ECTS credits.

##### **§ 3 Language of instruction and examinations**

- (1) The courses and examinations in the master's program in Mikrosystemtechnik are generally held in German. Individual modules and courses, which are freely selectable, and their associated examinations can also be held entirely or partly in English.

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(2) With the prior consent of the person responsible for the module, examinations may also be held in the other language.

### § 4 Content of the program

(1) In the master's program in Mikrosystemtechnik, modules with a total of 120 ECTS credits must be completed in accordance with the regulations in paragraphs 2 to 5. The modules that can be taken in the individual areas and the corresponding courses are listed and described in more detail in the respective module handbook. According to the specifications mentioned in Paragraph 6, the master's program in Mikrosystemtechnik can be studied with a specialization.

(2) By completing the three compulsory modules listed in the following table and three of the four compulsory elective modules listed there, a total of 60 ECTS points must be acquired. The prerequisites and contents of the master's module are regulated in more detail in §§ 8 and 9.

Module	Format	Contact hours per week	ECTS-credits	Semester	Assessment: Studienleistung/ Prüfungsleistung
<b>Compulsory modules (42 ECTS-Credits)</b>					
Mikroelektronik	V + Ü	4	6	1	PL: examination
Mikromechanik	V + Ü	4	6	1	PL: examination
Mastermodul			30	4	PL: master's thesis PL: oral presentation
<b>Compulsory elective modules (18 ECTS-Credits)</b>					
Aufbau- und Verbindungstechnik	V + Ü	4	6	1	PL: examination
Mikrofluidik	V + Ü	4	6	1	PL: examination
Mikrooptik	V + Ü	4	6	1	SL PL: examination
Sensorik	V + Pr	4	6	1	SL PL: examination

Abbreviations in the table:

Type = type of course; Semester = recommended semester when taking up studies in the winter semester; Pr = practical course Ü = exercise;

V = lecture; SL = pass/fail assessment PL = graded assessment

(3) A total of 48 ECTS points must be acquired in the microsystems technology specialization with the specialization areas of circuits and systems, materials and fabrication, biomedical engineering and photonics. The student chooses in which of the four specialization areas he/she acquires at least 30 ECTS credits; the remaining 18 ECTS credits can be completed in the same or one or more of the other specialization areas at the student's choice. Each module has a scope of 3, 6 or 9 ECTS points and can be selected from the range of courses provided in the module handbook for the individual areas of specialization. Each module is completed with a graded assessment (Prüfungsleistung); depending on the structure of the associated

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courses, additional pass/fail assessments may also be required in the modules offered. It is ensured that students can choose between different types of graded assessments (Prüfungsleistungen)

(4) A total of 12 ECTS points must be acquired in the area of *Individuelle Ergänzung und Vertiefung* by completing suitable modules or classes from courses offered by other degree programs of the Albert Ludwig University, language courses from the range of courses offered by the seminars and institutes of the Faculty of Philology and the Faculty of Philosophy (courses for students of all faculties) The board of examiners (*Fachprüfungsausschuss*) decides on the suitability of the modules or courses from the range of courses offered by other degree programs of the Albert Ludwig University in consultation with the respective subject. In the modules or courses from the range of courses offered by other degree programs and in the language course, only pass/fail assessments (*Studienleistungen*) are required; for the modules from the range of courses offered by this degree programme, paragraph 3, sentences 4 and 5 shall apply accordingly.

(5) In the microsystems technology specialization and in the selected specialization area as well as in the area of *Individuelle Ergänzung und Vertiefung*, no more modules or courses can be completed than are necessary to achieve the respective required or maximum permissible number of ECTS points.

(6) The area of specialization chosen in accordance with Paragraph 3 Sentence 2 may be chosen as a specialization if the topic of the master's thesis is also selected from the relevant area of specialization.

### **§ 5 Pass/fail assessments (Studienleistungen)**

Non-graded assessments can consist, for example, of written examinations, presentations or posters, the completion of exercise sheets and project tasks or the performance of experiments.

### **§ 6 Graded assessments (Studienbegleitende Prüfungsleistungen)**

Written graded assessments are examinations (written supervised work) and written elaborations. Oral graded assessments are oral examinations (examination discussions) and oral presentations. Practical graded assessments consist of the performance of experiments and the creation and demonstration of software or demonstrators.

### **§ 7 Repeat of graded assessments**

(1) Assessments graded "not adequate" (5.0) or considered as failed, can be repeated once. In addition, a maximum of two failed graded assessments, which consist of a written or oral examination, can be repeated a second time.

(2) If a student fails a graded assessment in a module from the compulsory elective modules according to § 4, paragraph 2 or in a module from the field of microsystems technology, he/she may, instead of retaking this graded assessment, also take another suitable module once and take the graded assessment during that course. The failed examination attempt in the originally

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selected module must not be considered as one of the failed attempts in the newly selected module.

(3) A maximum of one passed examination in the form of a written examination or an oral examination may be repeated once for the purpose of improving the grade. The repeat examination is to be taken in the next regular examination date and in the third semester at the latest. The examination with the better grade is taken into account.

### **§ 8 Admission to the Master's thesis**

Only students who are enrolled in the master's program in Mikrosystemtechnik and have successfully completed modules with a total of at least 72 ECTS credits can be admitted to the master's thesis.

### **§ 9 Master's thesis**

(1) The master's thesis must be completed within a period of six months and is worth 27 ECTS credits. If a specialization is chosen, the topic of the master's thesis shall be selected from the specialization area selected in accordance with § 4, Paragraph 3, Sentence 2.

(2) The master's thesis shall be written in German or English.

(3) The master's thesis shall be submitted to the Board of Examiners in bound form in single copy and additionally in electronic form on the specified data carrier system in the specified file format. In the case of data or software-related work, the submission of the program codes and data used may also be required.

(4) At least one of the two examiners of the master's thesis must be employed full-time at the Institute of Microsystems Engineering at the Faculty of Engineering of the Albert Ludwig University.

(5) The master's thesis is supplemented by an approximate Master's colloquium (thesis defence) of about 60 minutes, which is conducted in German or in English at the student's choice. The master's colloquium is usually led and assessed by the supervisor of the master's thesis and consists of an approximately 20-minute presentation by the student on the results of the master's thesis and a subsequent discussion. Admission to the master colloquium is only granted if the master thesis has been submitted. The Master colloquium is worth 3 ECTS credits and is usually open to the public.

### **§ 10 Calculation of the final overall grade**

(1) The final grade of the Master's examination is calculated according to the arithmetic mean of module grades with regard to the allocation of ECTS credits.

(2) If all the module grades are "very good" - 1.3 or better - or if the overall grade of the master's examination is 1.0, the grade "with distinction" will be awarded.

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### **§ 11 Subject designation with specialization supplement in the degree documents**

In the case of successful completion of the master's program in Mikrosystemtechnik with one of the four specializations Circuits and Systems, Materials and Fabrication, Biomedical Engineering or Photonics, the title of the subject Microsystems Engineering shall be added to the degree certificate according to the completed specialization with the addition "Specialization Circuits and Systems", "Specialization Materials and Fabrication", "Specialization Biomedical Engineering" or "Specialization Photonics".

#### Transitional regulation § 31 of the Framework Examination Regulations

(#) Students already enrolled in the Master of Science Mikrosystemtechnik degree program at the Albert Ludwigs University before 1 October 2021 may continue their studies according to the corresponding subject-specific provisions of these examination regulations of 19 August 2005 (official announcement). August 2005 (Official Announcements Jg. 36, No. 46, pp. 269-293) in the version of the Thirty-Ninth Amendment Statute of 17 December 2018 (Official Announcements Jg. 49, No. 69, pp. 489-516) until 30 September 2023 (cut-off date) at the latest. In this case, the student must declare in writing to the Examinations Office by 31 October 2021 at the latest that he/she wishes to continue his/her studies in accordance with the subject-specific regulations for microsystems technology of this examination regulations in the version of the Thirty-Ninth Amendment Statutes of 17 December 2018. This declaration is irrevocable.