Unofficial Translation

Excerpt from the

Examination Regulations for the Degree Program Master of Science (M.S.)

Appendix B. Program-specific provisions for the Examination Regulations for the Master of Science (M.S.)

Embedded Systems Engineering

§ 1 Program profile

(1) The Master in Embedded Systems Engineering degree program is research-oriented and consecutive.

(2) The Master in Embedded Systems Engineering degree program provides in-depth knowledge in the design, development, and application of embedded systems. In particular, this includes knowledge of the design of microelectronic, micromechanical, and software-based components, as well as their integration into an overall system which meets optimization goals such as speed, costs, energy efficiency, and reliability. Depending on their individual focus area, students can acquire specialist knowledge in the areas of circuits and systems, design and simulation, sensors and actuators, reliable embedded systems, distributed systems, and robotics and computer vision. One of the main goals of the Master in Embedded Systems Engineering degree program is to train students to undertake independent research work in these areas.

§ 2 Program entry and program scope

(1) Students may enter the Embedded Systems Engineering master's degree program at the start of either the winter or the summer semester.

2) The Master in Embedded Systems Engineering degree program comprises coursework equivalent to 120 ECTS credits.

§ 3 Language

Unless otherwise specified in the course catalog, courses and examinations are conducted in German or English.

§ 4 Mentors

At their own request or at the request of a member of the Board of Examiners, students may be assigned a mentor who is either a tenured lecturer, an external lecturer, or an experienced member of the academic staff at the Faculty of Engineering of the University of Freiburg.

§ 5 Program curriculum

1) The Master in Embedded Systems Engineering degree program is divided into a required area and an elective area. The courses available in the individual modules and the applicable admissions requirements are listed in the current module handbook and are announced to students at the proper time.

(2) In the required area, all modules listed in the following table must be completed.

Required area (69 ECTS credits)

Module	Type	SWS	ECTS credits	Semester	Form of assessment
Cyber-Physical Systems – Discrete Models	V + Ü	4	6	1 or 2	PL: written/oral

Sensors/Actuators	V + Pr	3	5	1 or 2	PL: written/oral
Assembly and Packaging Technology	V + Ü	3	5	1 or 2	PL: written/oral
Microelectronics	V + Ü	3	5	1 or 2	PL: written/oral
Modeling and System Identification	V + Ü	4	6	1 or 2	PL: written/oral
Computer Science key course	V + Ü	4	6	1 or 2	PL: written/oral
Computer Science key course or specialization course	V + Ü	4	6	1 or 2	PL: written/oral
Master's module Master's thesis Colloquium	 – –	 – –	 27 3	 4 4	 PL: written SL: oral

Abbreviations used in the table:
Type = Type of course; SWS = planned number of contact hours; Semester = recommended program semester; V = lecture; Ü = exercise; Pr = lab course; PL = exam; SL = assessed coursework

(3) In the elective subjects, which are divided into Concentrations and Personal Profile, students must pass elective modules with coursework equivalent to at least 51 ECTS credits. The elective modules offered are listed and described further in the module handbook. Each elective module should be equivalent to at least 5 ECTS credits and concludes with a written or oral assessment. No more than two elective modules that consist of only one seminar may be taken.

(4) In the area of Concentrations, students must select one area from Circuits and Systems, Design and Simulation, and Sensors and Actuators plus one area from Reliable Embedded Systems, Distributed Systems, and Robotics and Computer Vision. In the two areas chosen, students must pass modules equivalent to at least 15 ECTS credits in total.

(5) In the Personal Profile area, students must pass modules equivalent to at least 15 ECTS credits in total. The modules taken may be selected from those offered by the master's degree programs in the Faculty of Engineering in the subjects of Computer Science and Microsystems Engineering.

§ 6 Coursework

Each module may include coursework which the student must successfully complete in order to be admitted to the relevant module examination. Examples of such coursework are regular course participation, written exams, reports, or presentations. The type and scope of coursework are defined in the current module handbook and are announced to the students at the beginning of each course in the particular module.

§ 7 Course-based assessments

(1) As a rule, written course-based assessments take the form of supervised written exams, tests, research papers, or reports. Types of oral course-based assessment are presentations and oral exams (exam interviews). The type and scope of course-based assessment are defined in the current module handbook and are announced to the students at the beginning of each course in the particular module.

(2) Written exams have a maximum duration of 30 minutes per ECTS credit. They may consist entirely or partially of multiple-choice questions; the provisions described in § 17a of these examination regulations apply to such exams.

(3) Oral exams have a maximum duration of 10 minutes per ECTS credit.

§ 8 Repeating course-based assessments

(1) Course-based assessments that have been graded “not adequate" (5.0) or considered failed may be repeated once. In addition, a total of three failed assessments in the required or elective modules may be repeated a second time; this does not include lab courses and seminars or the master's thesis.

(2) The second retake must be held at the earliest possible examination session following the first retake. § 24 Paragraphs (3) and (4) of these examination regulations apply accordingly.

(3) Up to two assessments that have been successfully completed no later than the semester scheduled

in the curriculum may be retaken once each in order to improve the grade. This excludes presentations, research papers, reports and the master's thesis. The assessment must be retaken during the next regular examination session. The higher grade earned on the assessment will always be used.

§ 9 *(removed)*

§ 10 Admission to prepare the master's thesis

Admission to prepare the master's thesis is open only to students who have successfully completed modules worth a total of at least 75 ECTS credits in the Master in Embedded Systems Engineering degree program. Students who have been admitted to the Master in Embedded Systems Engineering degree program on the condition that they fulfill certain additional requirements must also provide evidence that they have fulfilled these requirements.

§ 11 Master's thesis

(1) The master's thesis must be written within a period of six months and is worth 27 ECTS credits.

(2) At least one of the two evaluators of the master's thesis must be a full-time faculty member of the Faculty of Engineering at the University of Freiburg.

(3) The master's thesis must be written either in German or in English. If the master's thesis is written in English, it must contain a summary in German.

(4) The master's thesis must be submitted to the Examination Office in three bound hardcopies as well as in electronic form on a common data storage system (such as CD or DVD).

(5) The master's thesis is supplemented by a final colloquium worth 3 ECTS credits. Candidates are admitted to the final colloquium only upon submission of the master's thesis. The final colloquium is held in the presence of one of the thesis evaluators and is generally open to university members.

§ 12 Determination of module grades

If a module includes several partial module examinations, the module grade is calculated from the weighted arithmetic mean of the grades awarded in the partial module exams; weightings are based on the relative number of ECTS credits per exam.

§ 13 Determination of the overall grade

(1) The overall grade is calculated from the weighted arithmetic mean of the module grades; weightings are based on the relative number of ECTS credits per module.

(2) Students who receive the grade "very good" – 1.3 or better – on all assessments or the overall grade 1.0 are awarded the distinction "with honors."

Publication of the text of the statute in German:

"Prüfungsordnung für den Studiengang Master of Science (M.Sc.)" from 19 August 2005 (*Amtliche Bekanntmachungen* Vol. 36, No. 46, pp. 269–293), in the version from 21 December 2015 (*Amtliche Bekanntmachungen* Vol. 46, No. 77, pp. 463–481)

Only statutes published in the *Amtliche Bekanntmachungen der Albert-Ludwigs-Universität Freiburg in Breisgau* are legally binding.