

**New version of the Study Regulations
for the degree programme Mechatronics & Robotics (Master of Engineering)
at the Faculties of Electrical Engineering and Mechanical Engineering
at Schmalkalden University of Applied Sciences**

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Appendix: Curriculum Mechatronics & Robotics (Master of Engineering)

**§ 1
Scope of application, terms**

- (1) These study regulations, in conjunction with the valid examination regulations for the degree programme Mechatronics & Robotics (Master of Engineering), regulate the objectives, contents and structure of the degree programme Mechatronics & Robotics (Master of Engineering) at Schmalkalden University of Applied Sciences.
- (2) Status and function designations in these regulations apply in both male and female form.

**§ 2
Study requirements and beginning of studies**

- (1) Admission to the Master's degree programme of Mechatronics & Robotics at the Schmalkalden University of Applied Sciences shall be granted if the candidate achieved the degree of Bachelor of Science or Bachelor of Engineering or any equivalent degree in engineering in a relevant discipline (usually mechanical engineering, electrical engineering or mechatronics) with a score of at least 210 ECTS credit points and a total grade of at least 2.0. The completed programme must comprehend the following basic modules with the respective values as listed:

Subject field	When applying to	Scope
Higher Mathematics	Both main subjects	2 semester modules
Machine Design and CAD	Focus: Mechanical Engineering	3 semester modules
Circuit Design and Programming	Focus: Electrical Engineering	3 semester modules

For admission to the degree programme, proof of an English language qualification of at least level B2.2 must be provided. This corresponds to the certificates TOEFL iBT (internet-based) with 80 points or British Council (IELTS) with 6.5 points. Graduates of a higher education programme in predominantly English (MOI) must also prove the language qualification mentioned in sentence 2. This does not apply to native speakers.

- (2) All candidates who have obtained a degree of a programme at a university outside the jurisdiction of the German Basic Law can be admitted to our Master's degree programme upon detailed assessment and review of the technical orientation of the completed programme, the level of potential equivalence of the degree as well as the final result. § 11 (1) of the Examination Regulations applies accordingly. The grounds for the decision are to be entered into the records. The same shall apply if the Examination Board attests technical qualification in individual cases for candidates who do not fulfil the requirements as set out in (1).

§ 3

Objectives and contents of the degree programme

- (1) The study programme in the Master's degree programme Mechatronics & Robotics qualifies graduates to work as a Master of Engineering in an engineering profession. The degree programme combines training concepts of electrical engineering and information technology with the training concepts of mechanical engineering. Graduates of the Mechatronics & Robotics degree programme can work in product development, production and manufacturing technology, automation technology, quality and project management and also in marketing and technical sales of mechatronic systems. Design and simulation as well as trials and testing are just as relevant as production and manufacturing, including recycling.
Companies in the field of mechanical and plant engineering, but also in the automotive and supplier industry, consumer electronics, the aerospace industry, drive, automation and conveyor technology as well as in machine tool construction are potential employers. There are also career prospects in robotics, medical technology, energy technology and environmental technology.
- (2) The Master's thesis is focussed and is supervised interdisciplinarily by professionally competent supervisors and is usually worked on as an individual thesis. In addition to extended basic technical knowledge, the courses impart in-depth and specialised knowledge based on scientific findings and methods.
- (3) Individual profile formation results from the composition of the compulsory elective modules in the field of mechanical engineering and electrical engineering, as well as from the orientation of the final thesis in one of these directions.
- (4) Successful completion of the Master's programme in Mechatronics & Robotics qualifies the student for admission to doctoral studies.

§ 4

Structure of the programme

- (1) The programme comprises three semesters of study. It is divided into two theoretical study semesters and one semester for the preparation and defence of the Master's thesis.
- (2) The third semester serves to work on the final thesis (Master's thesis = 27 ECTS) and its defence (colloquium = 3 ECTS).
- (3) In particularly justified cases, the Faculty Council may decide to exchange individual subjects between the theoretical study semesters. There is no legal claim to all compulsory elective modules being offered in every semester. The Faculty Council decides in good time before the start of the semester which compulsory elective modules will be offered. Compulsory elective modules chosen by fewer than five students may be cancelled.
- (4) An appropriate number of modules must be taken by all students in the degree programme. Technical compulsory elective modules of electrical engineering and information technology and mechanical engineering or foreign language from the overview in the appendix of at least 20 ECTS credit points are to be freely selected. The elective module Workshop Mechatronics II can only be taken if the elective module Workshop Mechatronics I has been successfully completed.
- (5) The lecture language is English. The Master's thesis must be written and defended in English.
- (6) A legal claim to a place on the list for laboratory practicals in the compulsory and elective modules exists only if completed in the regular semester of study, unless the candidate can credibly prove that he/she was unable to do so due to prolonged or permanent physical disability or illness. A medical certificate may be required for this purpose.

§ 5

Types of classes

In the degree programme Mechatronics & Robotics (Master of Engineering), courses can be held in the following form:

1. Lecture

Coherent presentation and communication of basic and specialised knowledge as well as scientific methods; the course content is developed here through close links between the lecture and its exemplary deepening; the lecturer conveys and develops the course material with the participation of the students.

2. Seminar lecture

The teaching content is developed here by closely linking the lecture with its exemplary deepening. The lecturer conveys and develops the subject matter with the participation of the students.

3. Project work

Independent work on a complex task using scientific methods; a whole spectrum of methods can be applied; the tasks set are solved in project groups or as individual work.

4. Exercise

Application-related reflection of course material; deepening of methodological knowledge by solving exemplary tasks, which are solved in individual or group work.

5. Laboratory practical course

Promotion of experiential education in handling equipment and systems through practical application of methodological knowledge including evaluation and assessment of the results obtained

§ 6 Commencement

These examination regulations apply for the first time to students who begin their studies in the Master's degree programme Mechatronics & Robotics in the winter semester 2021/2022.

Schmalkalden, December 2020

Prof. Dr. Gundolf Baier
President of Schmalkalden University of Applied Sciences

Lectures for Mechatronics and Robotics (M.Eng.)

valid from year 2023/2024

Mechatronics & Robotics (M.Eng.)

	ECTS	Le	Ex	Lab	Σ	ECTS	PV
Obligatory Modules 1st Term					24 (25)*	20	
Automation Control	5	4					
Mechanical Problems in Mechatronics	5	2		2			
Development of Mechatronic Systems	5	2	2				
Sensor Systems	5	3	1				
Elective Modules 1st Term, select 2 of 5						10	
German Language I	5		4				
Rapid Control Prototyping*	5	4	1				T
Vibration Engineering	5	2	2				
Workshop Mechatronics I (Preparation)	5	1		3			
Communication Systems	5	3		1			T
Obligatory Modules 2nd Term					24	20	
Systemstheory	5	3	1				
Design of Robot Workplaces	5	2	2				T
Robotic Vision	5	2		2			
Digital Signalprocessing for Engineering Application	5	3		1			T
Elective Modules 2nd Term, select 2 of 4						10	
German Language II	5		4				
Applied Physics	5	3		1			N
Aspects of Production Planning and Work Design	5	4					
Tribology in Micromechanics	5	2		2			T
Workshop Mechatronics II (Finalization)	5					30	
Obligatory Modules 3rd Term							
Master Thesis	27						
Kolloquium	3						

expired schedule, valid for older years until 2022

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Mechatronics & Robotics (M.Eng.)

	ECTS	V	Ü	L	Σ	PV
Pflichtmodule 1. Semester					24	
Automation Control	5	4				
Vibration Engineering	5	2	2			
VDI 2206 - Development of Mechatronic Systems	5	2	2			
Sensor Systems	5	3	1			
Wahlpflichtmodule 1. Semester: 2 aus 5 zu wählen						
German Language I	5	4				
Digital Signalprocessing for Engineering Application	5	3		1		T
Rapid Controll Prototyping	5	4	1			T
Mechanical Problems in Mechatronics	5	2	2			
Workshop Mechatronics I (Preperation)	5	1		3		
Pflichtmodule 2. Semester						
System Theory	5	3	1			
Design of Robot Workplaces	5	2	2			T
Communication Systems	5	3	1			T
Robotic Vision	5	2	2			
Wahlpflichtmodule 2. Semester: 2 aus 4 zu wählen					24	
German Language II	5	4				
Applied Physics	5	3		1		N
Quality Management	5	4				
Workshop Mechatronics II (Finalization)	5	1		3		
Pflichtmodule 3. Semester						
Master Thesis	27					
Kolloquium	3					