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Examination regulations for the degree programme Mechatronics and Robotics (Bachelor of Engineering) at the Faculties of Mechanical Engineering and Electrical Engineering at Schmalkalden University of Applied Sciences

dated 24 October 2023

In accordance with Sections 3 , subsection 1 and Section 38, subsection 3 of the Thuringian Higher Education Act (ThürHG) dated 10 May 2018 (GVBl. p. 149), last amended by article 1 of the Act of 7 December 2022 (GVBl. p. 483) in conjunction with Sections 16, subsection 1, sentence 2 no.1, 21 Para. 1 Sentence 4 No. 4, 22 Para. 3 of the Basic Regulations of Schmalkalden University of Applied Sciences dated 11 April 2019 (Thuringian State Gazette No. 18/2019, p. 807), Schmalkalden University of Applied Sciences issues the following on the basis of the examination regulations approved by the President on 24 October 2023 the following study regulations for the Bachelor's degree programme in Mechatronics and Robotics. The Council of the Faculty of Mechanical Engineering adopted the study regulations on 11 October 2023, the Council of the Faculty of Electrical Engineering adopted the study regulations on 11 October 2023; the Central Study Commission approved them on 18 October 2023.

The President of Schmalkalden University of Applied Sciences approved the study regulations in a decree dated 24 October 2023.

Table of contents

§ 1 Scope of application.....	2
§ 2 Standard period of study and scope of study	2
§ 3 Examination structure	2
§ 4 General admission requirements	2
§ 5 Deadlines.....	3
§ 6 Examination performances	3
§ 7 Assessment of examinations and grading	4
§ 8 Failure to attend, withdrawal, cheating, breach of regulations	5
§ 9 Passing and failing.....	5
§ 10 Repeating examinations.....	6
§ 11 Recognition of prior examinations and examination achievements.....	6
§ 12 Examination Board.....	7
§ 13 Examiners.....	7
§ 14 Responsibilities	7
§ 15 Purpose and organisation of the Bachelor's examination	8
§ 16 Type and scope of the Bachelor's examination	8
§ 17 Issue and completion time of the Bachelor's thesis	8
§ 18 Submission, assessment and repetition of the Bachelor's thesis, colloquium	8
§ 19 Calculation of the overall grade, certificate and diploma supplement	9
§ 20 Bachelor's degree	10
§ 21 Invalidity of the Bachelor's examination.....	10
§ 22 Special regulations for students in a double degree programme (double degree)	10

§ 23 Inspection of examination documents	10
§ 24 Equality clause.....	10
§ 25 Entry into force.....	10
Appendix: Table 1: Modules and examinations Mechatronics and Robotics (B. Eng.) ...	12

§ 1 Scope of application

These examination regulations according to § 55 ThürHG apply to the degree programme Mechatronics and Robotics with the degree "Bachelor of Engineering (B. Eng.)" at the Faculties of Mechanical Engineering and Electrical Engineering at Schmalkalden University of Applied Sciences.

§ 2 Standard period of study and scope of study

(1) The standard period of study is seven semesters including an engineering internship of 25 weeks and a final thesis (Bachelor's thesis). Periods of leave of absence in accordance with § 8 of the enrolment regulations of Schmalkalden University of Applied Sciences are not taken into account. This also applies to periods of maternity leave, parental leave and carer's leave.

(2) Admission, content, procedure and recognition of the engineering internship are regulated in the internship regulations (appendix to the study regulations).

(3) 210 ECTS credit points must be acquired.

§ 3 Examination structure

(1) The Bachelor's examination consists of module examinations including the engineering internship, Bachelor's thesis and colloquium modules.

(2) Module examinations are taken as examinations during the course of study.

(3) Examination performances are individual concrete examination procedures (oral or written examination). An examination performance is assessed and graded in accordance with § 7.

(4) Examinations should generally be taken for the first time in the corresponding subject-related semesters (see Appendix Table 1).

(5) Preliminary examination work may be required as a prerequisite for obtaining a module grade. Preliminary examination work is generally to be completed in the form of laboratory notes, design documents, project work, exercises or written examinations. Preliminary examination work is assessed and can be graded in accordance with § 7. Further details on the type and scope of any preliminary examination work are set out in the respective module description.

§ 4 General admission requirements

(1) Only those students may take part in the module examinations who

a) have a higher education entrance qualification in accordance with § 67, sub. 1 to 3 ThürHG or

b) are recognised as equivalent by law or by the relevant authority on the basis of an entrance qualification, or

c) have been admitted to the degree programme on the basis of the university entrance examination regulations of Schmalkalden University of Applied Sciences

and is enrolled on the Bachelor's degree programme in Mechatronics and Robotics at Schmalkalden University of Applied Sciences for at least the entire semester prior to the respective module examination.

(2) Participation in the module examinations of the 1st and 2nd semesters is compulsory. Registration for these examinations is carried out automatically by the Central Examination Office. It is not possible to deregister from the examination.

(3) As a rule, only those students are admitted to a module examination in the 3rd to 6th semesters who

a) have achieved at least 30 ECTS from the modules of the 1st and 2nd semesters and

b) have previously registered for this module examination with the Central Examination Office within the two-week enrolment period announced throughout the university.

Cancellation is possible up to three working days before the examination date at the Central Examination Office.

(4) Admission to a module examination may only be refused if

a) the requirements specified in § 1 are not fulfilled or

b) the candidate has definitively failed the Bachelor's examination in the chosen degree programme at a university within the scope of the German Constitution or the candidate is in an examination procedure in the chosen degree programme that has not yet been completed or

c) the candidate has failed to meet the deadline for registering for the corresponding examination.

§ 5 Deadlines

(1) Module examinations must be taken within the examination periods set by the Presidential Board. Deviating from this, the examination period of the 6th semester is determined by the examination board of the faculties.

(2) The prerequisite for starting the engineering internship is proof of 100 ECTS credit points.

(3) The Bachelor's examination should be completed by the end of the standard period of study.

§ 6 Examination performances

(1) In the examinations, the candidate should demonstrate that they can solve problems and work on topics using the usual methods of the examination subject in a limited amount of time and with limited aids. It should also be established whether the candidate has a broad basic knowledge.

(2) The duration of the written examinations is 60 minutes per module with 2.5 ECTS and 120 minutes per module with 5 ECTS.

(3) Written examinations may not be predominantly based on the multiple-choice method.

(4) Oral examinations are taken in front of at least one examiner and one expert assessor as a group examination or as an individual examination.

(5) The duration of the oral examinations is a minimum of 15 minutes and a maximum of 45 minutes per candidate and module.

(6) The main subjects and results of the oral examinations are to be recorded in a protocol. The candidate shall be informed of the result on the day of the oral examination.

(7) If the candidate can credibly demonstrate that they are unable to take examinations in the intended form in whole or in part due to a prolonged or permanent physical disability or illness, the candidate shall be permitted to take the examinations within an extended processing time or to take equivalent examinations in another form. A medical certificate may be required for this purpose. The same applies to preliminary examination work.

(8) Alternative examinations are provided for in some subjects. These are controlled examinations assessed according to the same standards, which are generally taken outside of the specified examination periods. They can take the form of a written examination, a presentation, a term paper, a presentation, practical work, project work or seminar work. If the form is not already specified by the study regulations or the module descriptions, it will be determined by the lecturer responsible for the module and announced at the latest at the beginning of the lecture period.

(9) How an examination is to be completed will be publicly announced before the start of the lecture period.

(10) For examinations to be taken in electronic form or via electronic communication, the statutes governing interdisciplinary provisions for examination procedures in electronic form or in electronic communication at Schmalkalden University of Applied Sciences (online examination statutes) apply.

(11) Examinations must be taken in English; this does not apply to the modules "German Language I to V".

§ 7 Assessment of examinations and grading

(1) The grades for the individual examinations are determined by the respective examiners within 2 months of the examination. The following grades are to be used for the assessment of examinations:

1 = very good = excellent performance

2 = good = performance significantly above average requirements

3 = satisfactory = a performance that meets average requirements

4 = sufficient = a performance that still meets the requirements despite its shortcomings

5 = insufficient = a performance that no longer fulfils the requirements due to significant deficiencies.

Individual grades may be increased or decreased by 0.3 to intermediate values in order to differentiate the assessment of examination performance; the grades 0.7, 4.3, 4.7 and 5.3 are excluded.

(2) If preliminary examination work is graded, this is done in accordance with § 1. One-third of this grade, or the arithmetic mean of the individual grades in the case of several graded preliminary examination work, is included in the grade for the module examination. Preliminary examination work and examination work must each have been graded with at least "sufficient" (4.0).

(3) The overall grade is calculated in accordance with § 19. Only the first decimal place after the decimal point is taken into account; all other decimal places are cancelled without rounding. The overall grade is as follows:

with an average up to and including 1.3	=	excellent
with an average up to and including 1.5	=	Very good
with an average from 1.6 up to and including 2.5	=	good
with an average from 2.6 up to and including 3.5	=	satisfactory
with an average from 3.6 up to and including 4.0	=	sufficient

§ 8 Failure to attend, withdrawal, cheating, breach of regulations

(1) The examination is deemed to have been assessed as "insufficient" (5.0) if the candidate misses an examination date that is binding for them without a valid reason or if they withdraw from an examination that they have started without a valid reason. The same applies if an examination is not completed within the scheduled time. Once the examination tasks have been issued, the candidate may not withdraw from the examination.

(2) The reason given for the withdrawal or failure must be notified to the Faculty's Examination Board immediately in writing and substantiated. In the event of illness of a candidate, a child to be cared for by the candidate or a relative in need of care, the candidate must immediately submit a medical certificate and, in cases of doubt, a certificate from a doctor appointed by the university. If the reason is recognised, the examination must be repeated at the next possible date, i.e. usually in the examination period of the next semester.

(3) If the candidate attempts to influence the result of their examination performance or preliminary examination performance by cheating or using unauthorised aids, the performance in question will be assessed as "insufficient" (5.0). A candidate who disrupts the orderly progress of the examination may be excluded from continuing the examination or preliminary examination by the respective examiner or invigilator; in this case, the performance will be assessed as "insufficient" (5.0).

(4) Within the first two months of the following semester, the candidate may request that the decisions under § 3 be reviewed by the Faculty's Examination Board. Decisions must be communicated to the candidate in writing without delay. In the event of a decision in the candidate's favour, the reasons for the decision must be stated and legal remedies must be provided.

§ 9 Passing and failing

(1) A module examination is passed if the examination has been graded at least "sufficient" (4.0). The candidate receives ECTS credit points for each module examination passed.

(2) The Bachelor's examination is passed if all module examinations have been passed and 210 ECTS credit points have been achieved.

(3) As a rule, the results of written examinations must be announced in an appropriate manner by the start of lectures in the following semester at the latest, in compliance with data protection regulations.

(4) If the candidate has not passed the Bachelor's examination, a certificate will be issued upon request and upon presentation of the relevant evidence and the certificate of exmatriculation, which contains the examinations taken and their grades as well as the missing examinations and indicates that the Bachelor's examination has not been passed.

§ 10 Repeating examinations

(1) Failed examinations may be retaken no more than twice. It is not permitted to repeat an examination that has been passed. Failed attempts in the same degree programme at other universities in the Federal Republic of Germany shall be taken into account.

(2) A module examination is deemed to have been definitively failed if an examination has been assessed as "insufficient" (5.0) three times.

(3) Students must be given the opportunity to take all examinations once per semester.

(4) Examinations are to be assessed by two examiners in the case of the last repeat examination. The grade is calculated from the arithmetic mean of the individual assessments. The last repeat examination may also be oral. This is at the discretion of the examiner.

§ 11 Recognition of prior examinations and examination achievements

(1) Preliminary examination achievements and examination achievements from other degree programmes at universities shall be credited upon application, provided that the university cannot prove any significant differences to the applicant. In the case of the crediting of prior examinations and examination achievements completed outside the Federal Republic of Germany, the equivalence agreements approved by the Standing Conference of the Ministers of Education and Cultural Affairs of the Federal States and the German Rectors' Conference, as well as agreements within the framework of university partnerships must also be observed.

(2) If examination achievements are recognised, the ECTS credit points and the grades - insofar as the grading systems are comparable - are to be adopted and included in the calculation of the overall grade. In the case of incomparable grading systems, the note "passed" shall be included. It is permissible to mark the crediting in the certificate.

(3) The crediting of knowledge and skills acquired outside of higher education is governed by the statutes on the crediting of knowledge and skills acquired outside of higher education at Schmalkalden University of Applied Sciences.

(4) If the prerequisites according to §§ 1 and 2 are met, there is a legal entitlement to credit transfer. Recognition of prior examination achievements and examination results is granted upon application to the Examination Board. This application must be accompanied by the documents required for the decision.

(5) Classification into a subject-related semester is based on the number of recognised ECTS credit points.

§ 12 Examination Board

(1) The Examination Board is responsible for the organisation of examinations and other tasks arising from these examination regulations. The Examination Board of the Mechatronics and Robotics (B. Eng.) degree programme consists of one professor from each of the two faculties and one student member of Schmalkalden University of Applied Sciences to be elected by the Electrical Engineering and Mechanical Engineering faculties. The term of office of the professorial members is three years, that of the student member one year.

(2) The members of the Examination Board and their deputies are appointed by the council of the respective faculties. The Examination Board elects the chairperson and deputy chairperson from among the professors appointed to it. As a rule, the chairperson conducts the business of the Examination Board.

(3) The Examination Board shall ensure that the provisions of these examination regulations are complied with. It reports regularly to the faculties on the development of examination results and on the distribution of module and overall grades. The report shall be published by the faculty in an appropriate manner. The examination board of the faculty makes suggestions for adjustments to the study regulations/curricula and examination regulations.

(4) The Examination Board has a quorum if at least both professors or their deputies are present and decide by a majority of the votes of the members present. In the event of a tie, the chairperson shall have the casting vote.

(5) The members of the Examination Board have the right to attend the examination.

(6) The members of the Examination Board and their deputies are subject to official secrecy. If they are not in public service, they must be sworn to secrecy by the chairperson.

§ 13 Examiners

(1) Only professors and other persons authorised to conduct examinations in accordance with § 54, sub 2 and 3 ThürHG shall be appointed as examiners.

(2) The names of the examiners should be announced to the candidate in good time.

(3) § 12 (6) applies accordingly to the examiners.

§ 14 Responsibilities

(1) The examiners decide on passing and failing (§ 9).

(2) The examination board of the faculty decides

1. on the consequences of violations of examination regulations (§ 8),

2. on the crediting of examination credits and examination achievements (§ 11),

3. on the appointment of examiners (§ 13),

4. on applications for Bachelor's theses (§ 17) and

5. on applications for an extension of the completion time for the Bachelor's thesis (§ 17 (4)).

(3) Unless otherwise stipulated in these examination regulations, the Examination Board shall decide on matters relating to the examination regulations.

§ 15 Purpose and organisation of the Bachelor's examination

(1) The Bachelor's examination forms the professional qualification of the Bachelor's degree programme. The Bachelor's examination determines whether the candidate has an overview of the interrelationships of their subject, has the ability to apply scientific methods and knowledge and has acquired the in-depth specialist knowledge required for the transition to professional practice.

(2) The module examinations of the Bachelor's examination are carried out during the course of study following the respective courses.

§ 16 Type and scope of the Bachelor's examination

(1) The Bachelor's examination consists of 31 compulsory modules with 145 ECTS credit points, 3 compulsory elective modules with 15 ECTS credit points, the engineering internship with 35 ECTS credit points, the Bachelor's thesis with 12 ECTS credit points and the colloquium with 3 ECTS credit points.

(2) The subject of the module examinations are the subject areas of the courses assigned to the modules in accordance with the study regulations. The type of examination is shown in Table 1 of the appendix.

§ 17 Issue and completion time of the Bachelor's thesis

(1) The Bachelor's thesis should demonstrate that the candidate is able to work independently on a problem using the scientific method within a specified period of time.

(2) The supervisor of the Bachelor's thesis is a professor or another full-time lecturer at Schmalkalden University of Applied Sciences. If the supervisor is not a member of the Faculty of Electrical Engineering or Mechanical Engineering, the approval of the Chair of the Examination Board is required. The co-supervisor and second supervisor of the Bachelor's thesis is a professor or another person authorised to conduct examinations in accordance with § 54, sub 2 ThürHG.

(3) The Bachelor's thesis is issued by the examination board of the respective faculty. The topic and date are to be recorded. The candidate may express topic requests. The Bachelor's thesis can only be issued when the candidate has achieved at least 180 credit points. However, all examinations in the first four semesters must have been completed in full, i.e. to the extent of 120 ECTS credit points, in accordance with Table 1 in the appendix.

(4) The Bachelor's thesis must always be completed at an institution outside the university. The processing time for the Bachelor's thesis is a minimum of 8 and a maximum of 12 weeks. The topic, task and scope of the Bachelor's thesis must be limited by the supervisor in such a way that the deadline for completing the Bachelor's thesis can be met. At the candidate's request, the completion time may be extended by a maximum of four weeks for reasons for which the candidate is not responsible.

§ 18 Submission, assessment and repetition of the Bachelor's thesis, colloquium

(1) The Bachelor's thesis must be submitted on time in printed form to the dean's office of the faculty to which the supervisor belongs. The time of submission must be recorded. When

submitting the thesis, the candidate must declare in writing that they have written the thesis - in the case of a group thesis, the appropriately labelled part of the thesis - independently and have not used any sources or aids other than those specified. If the Bachelor's thesis is not submitted within the processing time according to § 17 for reasons for which the student is responsible, it is deemed to have been assessed as "insufficient".

(2) The written assessment and evaluation of the Bachelor's thesis is carried out by the supervisor and the co-supervisor. The grade is calculated from the arithmetic mean of the assessments of both examiners. If the grades of the two examiners differ by more than two whole grade levels (difference of 2.0) or if one of the two examiners assesses the thesis as "insufficient", a third examiner is appointed by the Examination Board. The grade is then calculated from the arithmetic mean of the individual assessments of all three examiners, whereby the arithmetic mean for passing the Bachelor's thesis may not be lower than 4.0.

(3) The Bachelor's thesis can only be repeated once if the grade is worse than "sufficient" (4.0) or if it is not submitted on time.

(4) The candidate receives 12 ECTS credit points for passing the Bachelor's thesis.

(5) As part of a colloquium, the candidate should explain their Bachelor's thesis. The colloquium shall also cover questions from the entire subject area to which the Bachelor's thesis relates. As a rule, the colloquium should take place within the first four weeks after submission of the Bachelor's thesis. It can only be taken once 207 ECTS credit points have been achieved in module examinations. The supervisor and co-supervisor are also examiners in the colloquium unless the Examination Board decides otherwise. The assessment is based on the arithmetic mean of the examiners' individual grades. The colloquium lasts a minimum of 30 minutes and a maximum of 60 minutes. The candidate receives 3 credit points for passing the colloquium.

(6) The colloquium can only be repeated once if the grade is worse than "sufficient" (4.0).

§ 19 Calculation of the overall grade, certificate and diploma supplement

(1) The overall grade is calculated as the sum of the grades of the module examinations weighted by the factor number of credit points / 210. Rounding is carried out in accordance with § 7 (3).

(2) The candidate will receive a certificate for passing the Bachelor's examination. The module grades and the overall grade are included in the certificate. All grades are given in words and in brackets in decimal form with one decimal place. At the candidate's request, the results of the module examinations in additionally completed modules and the duration of study required to complete the Bachelor's examination are included in the certificate. In addition, a relative ECTS grade will be shown in the certificate if the number of graduates in the Mechatronics and Robotics (B.Eng.) degree programme is sufficient for a statistical analysis.

(3) The certificate bears the date of the day on which the colloquium was successfully completed. It is signed by the Dean of the respective faculty and the Chair of the Examination Board.

(4) The university issues a Diploma Supplement (DS) in accordance with the "Diploma Supplement Model" of the European Union / UNESCO. The current version of the text agreed between the Standing Conference of the Ministers of Education and Cultural Affairs and the German Rectors' Conference is to be used to represent the national education system.

§ 20 Bachelor's degree

If the Bachelor's examination is passed, the degree of "Bachelor of Engineering (B. Eng.)" is awarded.

§ 21 Invalidity of the Bachelor's examination

(1) If the candidate has cheated in an examination and this fact only becomes known after the certificate has been issued, the grade of the examination can be corrected in accordance with § 7 (1). If necessary, the module examination can be declared "insufficient" and the Bachelor's examination can be declared "failed".

(2) If the requirements for taking an examination were not met without the candidate intending to deceive about this and this fact only becomes known after the certificate has been issued, this deficiency is cured by passing the examination. If the candidate has wilfully and wrongfully obtained the opportunity to take the examination, the examination may be declared "insufficient" and the Bachelor's examination may be declared "failed".

(3) The candidate must be given the opportunity to comment before a decision is made.

(4) The incorrect certificate must be withdrawn and a new one issued if necessary.

§ 22 Special regulations for students in a double degree programme (double degree)

(1) If deviations from these examination regulations are deemed necessary within the framework of double degree programmes, in particular with regard to the standard period of study, the scope of credits and the examination modalities, the responsible examination board shall decide on this on the basis of the contractual agreements with the partner university.

(2) The certificate can only be issued if the graduate is enrolled at Schmalkalden University of Applied Sciences at the time of graduation, even if they are at the partner university to complete their studies. If there is documentary evidence that the student has completed their studies at the home university, then enrolment at Schmalkalden University of Applied Sciences is not required.

§ 23 Inspection of examination documents

Within one year of the announcement of the examination result, the candidate will be granted access to their written examination paper within a reasonable period of time upon request.

§ 24 Equality clause

Status and function designations in these regulations apply to all genders.

§ 25 Entry into force

These examination regulations apply for the first time to students commencing their studies on the Bachelor's degree programme in Mechatronics and Robotics in the first semester in the summer semester 2024.

Schmalkalden, 24 October 2023

The President Professor Dr Gundolf Baier

Appendix: Table 1: Modules and examinations Mechatronics and Robotics (B. Eng.)

Compulsory Moduels 1st semester	ECTS	ECTS	Type of Examination
Mathematics I	5		Written examination
Engineering Physics	5		Written examination
Measurement	5		Written examination
Electrical Engineering I	5		Written examination
Computer/Programming I	5		Written examination
German Language I	5	30	Written examination
Compulsory Modules 2nd semester			
Mathematics II	5		Written examination
Manufacturing Processes	5		Written examination
Automation I	5		Written examination
Electrical Engineering II	5		Written examination
Computer/Programming II	5		Written examination
German Language II	5	30	Written examination
Compulsory Modules 3rd semester			
Mechanical Design I	5		Written examination
Dynamics & Robotics	5		Written examination
Automation II	5		Written examination
Sensors	5		Written examination
German Language III	5		Written examination
Compulsory elective Modules 3rd Semester, select 1			
Materials Technology	5		Written examination
Communication Networks		30	Written examination
Compulsory Modules 4th Semester			
Mechanical Design II	5		Written examination
Rapid Manufacturing Design and Technologies	5		Written examination
Electronic Circuit Design	5		Written examination
Digital Signal Processing	5		Written examination
German Language IV	5		Written examination
Compulsory elective Modules 4th Semester, select 1			
Advanced Math for Robotics	5		Oral Examination
Microelectronics Technology		30	Written examination
Compulsory Modules 5th Semester			
Simulation Driven Design	5		Written examination
Manufacturing Process Design	5		Written examination
Drives Technology	5		Written examination
Human Machine Interaction	5		Written examination
German Language V	5		Written examination
Compulsory elective Modules 5th Semester, select 1			
Factory Planning and PPC	5		Written examination
Artificial Intelligence		30	Written examination
Compulsory Modules 6th Semester			
Robotics Lab	2,5		Written examination
Advanced Circuit Design	2,5		Written examination
Quality Management	2,5		Written examination
Career coaching, scientific writing and presentation skills	2,5		Written examination
Engineering Internship part 1	20	30	Interim Report
Compulsory Modules 7th Semester			
Engineering Internship part 2 and colloquium	15		Report and Oral Examination
Bachelor Thesis	12		Thesis
Colloquium	3	30	Oral Examination