

**Study and Examination Regulations
for the Master's Degree Programme
Electromobility, Autonomous Driving and Mobile Robotics, B.Eng.
at Deggendorf Institute of Technology**

of 1 October 2021

Based on Art. 13(2) Sentence 2, 58(1), 61(2) Sentence 1 of the Bavarian Higher Education Act (BayHSchG) of 23 May 2006 (GVBl. [law and official gazette] p. 245, BayRS 2210-1-1-WK), last amended by Section 1 Art. 186 of the Act of 26 March 2019 (GVBl. p. 98), Deggendorf Institute of Technology hereby enacts the following by-laws:

**Section 1
Aim of the study programme**

- (1) Through practice-based instruction founded on scientific findings and methods, this degree programme aims to enable students to pursue a career as an electrical and electronic engineer in the mobility applications field in which they can act on their own responsibility. Extensive training in the core subjects will enable students to discern the essential linkages and acquire the type of flexibility needed in order to keep pace with the rapidly advancing technical development, especially with regard to the "mobility" field. The training that they receive in the relevant subjects is designed to qualify students to recognise the impact that the realised mobility applications have on the environment and society so as to avoid any detrimental effects to the greatest extent possible.
- (2) Following their collective studies, students can then opt for one of two fields of specialisation depending on their personal preference. Irrespective of the field of specialisation chosen, the degree programme aims to qualify students to perform engineering activities in the following fields of work:
 - Development (conceptualisation, design, calculation, simulation and construction) of hardware and software;
 - Manufacturing (work preparation, production);
 - Project engineering;
 - Sales (customer consulting and project management);
 - Assembly, commissioning and service;
 - Operation and maintenance;
 - Monitoring and assessment.
- (3) Career possibilities especially present themselves in companies operating in the automotive and automotive parts industries but equally in administrative bodies in the public sector and also in independent practice. Care will be taken to deliver broad-ranging, qualified basic training that will enable successful graduates to work in a variety of professions.

Students will additionally acquire a deeper knowledge of a field relating to mobile applications and electrical engineering.

Section 2

Structure of the programme, standard period of study

- (1) The standard period of study is seven semesters, six of which are theory-based and one is practical. The internship semester is listed as the fifth semester.
- (2) A total of 210 ECTS credits must be attained.
- (3) As of the sixth semester, the degree programme is split to offer the following specialisations:
 - Electromobility (EM)
 - Autonomous driving / mobile robotics (FR)
- (4) One of the fields of specialisation, either EM or FR, is to be selected. Students will make their selection during the fourth semester of the programme. Students not making a choice will be assigned to a field of specialisation.

Section 3

Modules and courses

- (1) The degree programme consists of modules, which can be made up of thematically related courses. Each module is assigned ECTS points which reflect the time of study required of the students.
- (2) The compulsory and elective modules, the lectures, their number of hours, the type of courses, the examinations and the ECTS credits are specified in the Appendix to these by-laws. The regulations of subject-specific compulsory elective modules and compulsory elective subjects of a general academic nature are supplemented by the curriculum.
- (3) All modules consist of compulsory modules, compulsory elective modules or optional modules:
 1. Compulsory modules are those modules held during the degree programme which are binding for all students.
 2. Compulsory elective modules are alternative modules offered individually or in groups. Students are required to select a certain number of modules based on these study and examination regulations. The selected modules will be treated as compulsory modules.
 3. Elective modules are modules that are not necessarily required in order to achieve the study goals. They may be additionally selected from the courses offered by the Institute.
- (4) There is no guarantee that the scheduled specialisations, compulsory elective modules and optional modules will actually be offered. Similarly, The Language and Electives Centre is not under any obligation to actually administer the relevant courses if the number of attendees is insufficient.

Section 4 Curriculum

The responsible faculty, currently the Faculty of Electrical Engineering and Media Technology (EMT), will prepare a curriculum that ensures the relevant courses are offered and provides detailed information on the course of the programme to students. The curriculum is approved by the Faculty Council and announced to the public before the start of the semester. The announcement of changes and/or new regulations must be made no later than at the beginning of the lecture period of the semester in which these changes are to be applied for the first time. In particular, the curriculum will contain regulations and information regarding:

1. the time allocated for the weekly hours per semester, the time allocated per module and semester, including the attainable ECTS credits;
2. the names of the compulsory and compulsory elective modules as well as their respective number of weekly hours per semester;
3. the subject-related compulsory elective modules, including the number of hours involved;
4. the form of instruction used in each individual module, provided that this has not been conclusively specified in Appendix 2;
5. the examination format and exam duration;
6. the lectures accompanying the internship during the practical semester as well as their form of instruction and organisation
7. detailed provisions for proofs of performance and attendance.

Section 5 Basic modules

Study and examination achievements up to a scope of 60 ECTS credits, which were acquired in a similarly named or related bachelor's degree programme at a state or state-recognised university of applied sciences in Bavaria in basic modules of the degree programme, shall be credited upon application without further examination to the basic modules in a bachelor's degree programme at the admitting university. The basic modules of this degree programme are marked with an * in the curriculum.

Section 6 Basics and orientation examinations (GOP)

By the end of the second semester, the students must have achieved first examination results in the following modules:

- Mathematics 1
- Physics 1
- Basics of Electrical Engineering 1

for the first time. Past this deadline, the missing examination performance in any above-mentioned basics and orientation examination not yet taken will be rated "failed".

Section 7 Admission to the internship semester and the study specialisation

- (1) Admission to the EM-12 internship module in the third semester is only permissible if at least 42 ECTS credits have been attained and the examinations in

at least two of the modules Mathematics 1, Physics 1 and Basics of Electrical Engineering 1 have been passed.

- (2) Students are to choose their specialisation after the fourth semester of the degree programme. Students not making a choice will be assigned to a field of specialisation per a decision to be rendered by the examination committee.
- (3) Students require at least 80 ECTS credit points before they can commence their chosen specialisation.

Section 8 Internship semester

- (1) The internship semester comprises a minimum of 20 but no more than 24 weeks, of which two are devoted to practical-based lectures (PLVs).
- (2) If the training objective is not affected, then - by way of exception - students need not make up for interruptions in practical work if they are not responsible for these interruptions (e.g. shutdown, illness) and if the total number of days lost due to the interruption is not more than five working days. In the case of a reserve duty training exercise, the make-up period shall be waived if it does not last more than ten working days. Students must prove that they are not responsible for the interruption. If the interruptions extend beyond five and ten working days respectively, students must make up for the total number of lost days. Work completed as overtime can offset interruptions.

Section 9 Assessment of examination performance; overall examination grade

- (1) ECTS points are awarded for each successfully passed examination. The number of attainable points per exam is shown in the appendix.
- (2) 1A student's overall grade is calculated using a weighted arithmetic average of their individual grades. ²The weighting of each individual grade equates to the number of ECTS credits allocated to the course for which the grade was awarded.
- (3) In addition to the overall grade assigned as per para. 2, a relative grade is awarded based on the numerical value attained, in keeping with the ECTS User Guide, as per the provisions of Section 8(6) General Examination Regulations of Deggendorf Institute of Technology.
- (4) Should an end-of-module examination comprise multiple module component examinations, a grade of "nicht ausreichend" ("insufficient") awarded in one module component examination may not be offset by a higher grade in another.
- (5) The EM-21 practical semester is only awarded a pass grade ("bestanden") or fail grade ("nicht bestanden").

Section 10 Bachelor's thesis

- (1) When writing their bachelor's thesis, students will be required to demonstrate their ability to apply unassisted the knowledge and skills they have acquired in the course of their studies to complex tasks.
- (2) Students having acquired at least 160 ECTS credits are eligible to register for their bachelor's thesis.
- (3) The completion time for the bachelor's thesis is six months.

Section 11 Certificate

On passing the bachelor's examination, a corresponding certificate is issued in line with the sample shown in the appendix to the General Examination Regulations of Deggendorf Institute of Technology.

Section 12 Academic degree and diploma supplement

- (1) Based on the successful completion of the bachelor's examination, the academic degree "Bachelor of Engineering", abbreviated as: "B.Eng." is awarded.
- (2) A certificate granting the academic degree will be issued in accordance with the sample shown in the appendix to the General Examination Regulations of Deggendorf Institute of Technology.
- (3) The certificate will be accompanied by a Diploma Supplement outlining, in particular, the essential course content forming the basis of the degree, the progression of the studies, and the qualification obtained by virtue of the degree.

Section 13 Coming into effect

These study and examination regulations will come into effect on 1 October 2020. They shall apply to all students commencing their studies in the winter semester 2020/21 or later.

Appendix to the Study and Examination Regulations for the Bachelor's degree programme Electromobility, Autonomous Driving and Mobile Robotics at Deggendorf Institute of Technology

Bachelor's degree programme Electromobility, Autonomous Driving and Mobile Robotics			Semester hours per week (SWS)										Examinations						
Module No.	Name of module	Course no.	Course Name	SWS	1.Sem.	2.Sem.	3.Sem.	4.Sem.	5.Sem.	6.Sem.	7.Sem.	ECTS per course	ECTS	Type of instruction	Admission requirement	Exam format	Examination duration		
EM-01*	Mathematics 1	EM 1101		8	8								9	SU/Ü		schrP	90min.		
EM-02*	Physics 1	EM 1102		5	5								6	SU/Ü/Pr		schrP	90min.		
EM-03*	Basics of Electrical Engineering 1	EM 1103		8	8								9	SU/Ü/Pr		schrP	90min.		
EM-04*	Basics of Technical Computer Science	EM 1104	Computer Science 1	3	3							4	6	SU/Ü/Pr		schrP	90min.		
		EM 1105	Basics of Digital Technology	2	2							2		SU/Ü/Pr					
EM-05*	Mathematics 2	EM 2101		6	6								7	SU/Ü		schrP	90min.		
EM-06*	Physics 2	EM 2102		5	5								5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-07*	Basics of Electrical Engineering 2	EM 2103		7	7								8	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-08*		EM 2104		4	4								5	SU/Ü/Pr		schrP	90min.		
EM-09*	Computer Science	EM 2105	Computer Science 2	3	3								3	SU/Ü/Pr		schrP	90min.		
		EM 3101	Real-time Systems	3		3							4	SU/Ü/Pr		schrP	90min.		
EM-10	Statistics and Stochastic	EM 3102		4		4							5	SU/Ü		schrP	90min.		
EM-11	Electronic components	EM 3103		4		4							5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-12	Control Technology 1	EM 3104		4		4							5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-13	Electrical Metrology	EM 3105	Electrical Metrology	5		5						6	6	SU/Ü		schrP	90min.		
		EM 3106	Practical course: Electrical Metrology	3		3						0		Pr	eTN				
EM-14	Sensor Technology/Optics	EM 3107		4		4							5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-15	Microcomputer Technology	EM 4101		4			4						5	SU/Ü/Pr		PSTA			
EM-16	Electromagnetic Compatibility	EM 4102		4			4						5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-17	Image Processing	EM 4103		4			4						5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-18	Control Technology 2	EM 4104		4			4						5	SU/Ü/Pr	TN Praktikum	schrP	120min.		
EM-19	Power Electronics 1	EM 4105		4			4						5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-20	Electrical Machines	EM 4106		4			4						5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-21	Internship	EM 5101	Internship	x				x				23	25	Pr		Internship report			
		EM 5102	Practical Seminar	2					2			2		S		Presentation/report	15 min. / at least 10 DIN A4 pages		
EM-22	Practical Courses Taught as Seminars (PLV)	EM 5103	Practical Course Taught as Seminar (PLV) 1	2					2			2.5	5	SU/Ü		eTN			
		EM 5104	Practical Course Taught as Seminar (PLV) 2	2						2		2.5		SU/Ü		eTN			
EM-23	English for Engineers	EM 6101		4						4			5	SU/Ü	Compulsory attendance rate 75%	schrP	90min.		
EM-24	Automotive Bus Systems	EM 6102		4						4			5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-25	Elective module FWP	EM 6103	Subject-specific Compulsory Elective 1	4						4			5	SU/Ü/Pr		2)			
		EM 7101	Subject-specific Compulsory Elective 2	4							4			5	SU/Ü/Pr		2)		
EM-26	Compulsory Elective Subject of a General Academic Nature (AWP) 1	EM 2106	AWP 1	2		2							2	SU/ S		3)			
		EM 7102	AWP 2	2							2			2	SU/ S		3)		
EM-27	Key Qualifications	EM 7103	Business Administration	2							2		3	SU		schrP	90min.		
		EM 7104	Scientific Working Methods	2								2		3	SU/ S		PSTA		
		EM 7105	Sustainable Mobility	2								2		3	SU/ S		PSTA		
EM-28	Bachelor's Module	EM 7106	Bachelor's thesis	x							x	12	14	BA		BA			
		EM 7107	Seminar	2							2	2		S		mP	30min.		
Specialisation Electromobility																			
EM-29	Power Electronics 2	EM 6104		4						4			5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-30	Battery Technologies	EM 6105		4						4			5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
EM-31	Charging Stations, Hydrogen Technology	EM 6106		4						4			5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
Specialisation Autonomous Driving / Mobile Robotics																			
EM-32	Model-based Controller Design and Validation	EM 6107		4						4			5	SU/Ü/Pr		schrP	90min.		
EM-33	Autonomous Driving	EM 6108		4						4			5	SU/Ü/Pr		schrP	90min.		
EM-34	Mobile Robots	EM 6109		4						4			5	SU/Ü/Pr	TN Praktikum	schrP	90min.		
Total SWS				148	26	27	27	24	6	24	14								
Total ECTS				210	30	30	30	30	30	30	30		210						
as of 12/07/2022																			
Abbreviations:																			
ECTS	European Credit Transfer System	schrP	Written examination											S/SU/Ü	Seminar/seminar-based lesson, exercise class				
SWS	Semester hours per week	mP	Oral examination											S	Seminar				
ZV	Admission requirements	PSA	Written assignment											SU	seminar-style lesson				
*	Basic modules	Präs	Presentation											Ü	exercise class				
1)	To be selected from the Language Centre catalogue	PB	internship report																
		eTN	successful participation																
															2)	Both examination formats and their duration are specified in the catalogue of selectable elective (AWP) modules			

Issued on the basis of the enactment passed by the Senate of Deggendorf Institute of Technology on 25 March 2020, the approval issued by the Bavarian State Ministry for Science and Arts on 30 June 2020, Gz. H.6-H3441.DE/70/3 as well as the supervisory approval of the Vice-President of Deggendorf Institute of Technology of 01 October 2020.

Signed
Prof. Waldemar Berg
Vice President

These by-laws were recorded at Deggendorf Institute of Technology on 01 October 2020. The recorded by-laws were duly posted on the notice boards on 01 October 2020. Their day of announcement is therefore 01 October 2020.