Study and Examination Regulations for the Bachelor's Degree Programme Electronics Engineering for AI International at Deggendorf Institute of Technology

dated 08 May 2024

Based on Art. 9, 80 para. 1, 84 para. 2 (1) of the Bavarian Higher Education Innovation Act (BayHIG) of 5 August 2022 (GVBl. p. 414, BayRS 2210-1-3-WK), last amended by Section 3 of the Act dated 23 June 2023 (GVBl. p. 251) and by Section 2 of the Act of 24 July 2023 (GVBl. p. 455), Deggendorf Institute of Technology enacts the following by-laws:

Section 1
Aim of the degree programme

(1) The international bachelor's degree programme is aimed primarily at foreign students, who in addition to a specialist education are to be given a sound knowledge of the German language in the first three semesters. This should not only allow them to attend lectures in German from the fourth semester onwards, but also enable them to successfully enter the German labour market. Knowledge of the German language is also a fundamental prerequisite for long-term integration into German society.

The objective of the degree programme is to create a bridge between the subjects of classic electrical engineering and information technology and the future key technology of artificial intelligence (AI). Students focus not only on the diverse possibilities for integrating the advantages of artificial intelligence into electrical and IT systems, but also on the specific adaptation of the hardware required to implement the new technologies effectively and in a resource-saving manner. The aim is to create a direct link between the established foundations of engineering sciences, in particular electrical engineering and information technology, and the key technologies of the future, including applied data analysis, AI, intelligent sensor technology and the associated hardware components. Particular attention is paid to the practical application of these technologies and the development of innovative hardware and system solutions that optimise the use of AI in the field of electrical engineering and information technology and drive the transfer of technology to engineering disciplines.

Students gain an in-depth understanding of the application and integration of artificial intelligence (AI) and the associated hardware in the engineering sciences, especially in electrical engineering and information technology. Students will be qualified to use AI technologies in a targeted and effective manner in engineering problems and areas of application. Students are taught the necessary skills to combine traditional engineering methods with the latest developments in various key technologies in order to design innovative solutions for future challenges. Our aim is to train a new generation of engineers capable of responding to the demands of the future with creative, technology and hardware-based approaches.

(2) The degree programme aims to qualify students for engineering activities in the following fields of work:

- Development (conceptualisation, design, calculation, simulation and construction) of hardware and software for key technologies of the future,
- Research and development in the field of integration of AI-based applications in engineering sciences,
- Data analysis in the field of engineering sciences, - Project planning
- Operation and maintenance;
- Monitoring and assessment.

(3) Career opportunities are available not only in commercial and utility companies, but also in public sector administrations and in private practice. Care will be taken to deliver broad-ranging, qualified training that will enable successful graduates to work in a variety of professions. In addition, students gain in-depth knowledge of the application of artificial intelligence and other future key technologies in the field of engineering sciences with a focus on electrical engineering and information technology.

Section 2
Structure of the programme, standard period of study

(1) The degree programme comprises a standard period of study of eight semesters with seven theoretical and one internship semester. The sixth semester is the practical study semester.

(2) The lectures in the first three semesters are held entirely in English. As of the fourth semester, the language of tuition and that applied in the corresponding examinations will be German, the only exceptions being the Physics 2 and Real-Time Systems courses.

(3) German courses in the first three semesters enable international students to acquire level B2 in German according to the Common European Framework of Reference for Languages. German students will be required to attend other foreign language courses.

(4) A total of 240 ECTS credits have to be obtained.

Section 3
Proof of language proficiency

The following language proficiency must be proven in order to be admitted to this degree programme:

- German: Where German is not the native language, proof of Level A1 German, as defined under the Common European Framework of Reference for Languages, is to be provided.

- English: Where English is not the native language, proof of Level B2 English, as defined under the Common European Framework of Reference for Languages, is to be provided.

Regarding the proof, the regulations in section 3 of the Framework Examination Regulations for additional training in foreign languages and compulsory elective subjects of a general academic nature at Deggendorf Institute of Technology shall apply in the currently valid version.

Section 4
Modules and courses

(1) The degree programme comprises modules that may consist of thematically related courses. Each module is assigned ECTS points which reflect the time of study required of the students.

(2) The modules, courses, the number of hours for these, the type of courses, the examinations, and the ECTS credits have all been outlined in the annex to these by-laws

(3) All modules consist of compulsory modules or compulsory elective modules:
1. Compulsory modules are those modules held during the degree programme which are binding for all students.
2. Compulsory elective modules are the modules that are offered as alternatives, either individually or in groups. Students must select certain modules from these in accordance with these study and examination regulations. The selected modules will be treated as compulsory modules.

Section 5
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 semester hours;
3. the subject-related compulsory elective modules, including the number of hours involved;
4. the teaching format in the individual modules, provided this has not been conclusively defined in Appendix 1,
5. the type of examination and its 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 6
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 a 1) in the curriculum.

Section 7
Minimum ECTS score requirement (GOP)

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

- Mathematics 1
- Basics of Electrical Engineering and Information Technology 1

for the first time. Past this deadline, the missing examination performance in any examinations of the above-mentioned minimum ECTS score requirement not yet taken will be rated “failed”.

Section 8
Entry to various stages of the degree programme

(1) Admission to the B1 German course and the examination is only permissible if the A2 German course and examination have been passed.

(2) Admission to the B2 German course and the examination is only permissible if the B1 German course and examination have been passed.

(3) Only those who have passed the German B2 course and examinations will be admitted to the examinations from the fourth semester onwards.

(4) Admission to the Electrical Measurement Technology practical in the fourth semester is only permissible if at least 72 ECTS credits have been attained and the examinations in at least two of the modules Mathematics 1, Physics 1 and Basics of Electrical Engineering and Information Technology 1 have been passed.

Section 9
Internship semester

(1) The internship semester comprises a minimum of 20 but no more than 24 weeks.

(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. Overtime worked may be counted towards interruptions.

(3) Students may only be admitted to the practical semester if they have attained at least 100 ECTS credits.

Section 10
Assessment of examination performance; overall examination grade

(1) ECTS credits are awarded for each successfully passed examination. The number of attainable credits per exam is shown in the appendix.

(2) A student’s overall grade is calculated using a weighted arithmetic average of their individual grades. The 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 examination grade as set out in paragraph 2, a relative grade shall be shown based on the numerical value achieved according to the ECTS User Guide in accordance with the regulations in Section 8 paragraph 6 of the 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 practical seminar and the internship are only assessed as "passed" or "failed".

Section 11
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) Anyone who has obtained at least 190 ECTS credits can register for the bachelor‘s thesis.

(3) The completion time for the bachelor's thesis is six months.

(4) The bachelor's thesis is to be written in German.

Section 12
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 13
Academic degree and diploma supplement

(1) On successful completion of the bachelor's examination, the academic degree of "Bachelor of Engineering", abbreviated "B.Eng.", is awarded.

(2) A certificate on the awarding of the academic degree shall be issued according to the respective template given in the appendix to the General Examination Regulations of Deggendorf Institute of Technology.

(3) A diploma supplement – which describes in particular the essential course content underlying the degree, the course of study and the qualification obtained with the degree – is enclosed with the certificate.

Section 14
Coming into effect

These study and examination regulations enter into force on 1 October 2024. They apply to all students commencing the degree programme as of the 2025 summer semester.

Annex to the study and examination regulations for B.Eng. Electronics Engineering for AI International at Deggendorf Institute of Technology

B.Eng. Electronics Engineering for AI International				Weekly semester hours (SWS)												Examinations		
Module no.	Module name	Course no.	Course name	SWS	1. Sem.	2. Sem.	3. Sem.	4. Sem.	5. Sem.	6. Sem.	7. Sem.	8. Sem.	ECTS per cours	ECTS	Type of instruction	Admission requirement	Type of examination	Examination duration
EAI-01[1),2)]	Mathematics 1	EAI 1101		8	8									9	SU/Ü		schrP	90 min
EAI-02[1),2)]	Basics of Electrical Engineering and Information Technology 1	EAI 1102	GET1	5	5								6	8	SU/Ü/Pr		schrP	90 min
		EAI 1103	Basics of Digital Technology	2	2								2		SU/Ü/Pr		schrP	60 min
EAI-033)	German A2	EAI 1104		8	8									10		A1 certificate, 75% compulsory attendance	schrP	120 min
EAI-04[2)]	Self-organisation during your studies	EAI 1105		2	2									3	SU/Ü		eTN	
EAI-05[1),2)]	Mathematics 2	EAI 2101		6		6								7	SU/Ü		schrP	90 min
EAI-06[1),2)]	Basics of Electrical Engineering and Information Technology 2	EAI 2102	GET2	5		5							6	10	SU/Ü/Pr	TN Practical course	schrP	90 min
		EAI 2103	Computer Science 1	3		3							4		SU/Ü/Pr		schrP	90 min
EAI-073)	German B1	EAI 2104		8		8								10	SU/Ü/Pr	Passed German A2 exam 75% compulsory attendance	schrP	120 min
EAI-084)	Compulsory Elective Module (AWP)	EAI 2105	AWP 1	2		2								2			5)	
EAI-09[1),2)]	Basics of Electrical Engineering and Information Technology 3	EAI 3101	GET3	5			5						5	8	SU/Ü/Pr		schrP	90 min
		EAI 3102	Computer Science 2	3			3						3		SU/Ü/Pr		schrP	90 min
EAI-10[1),2)]	Basics of Programming (Python)	EAI 3103		4			4							5	SU/Ü/Pr		schrP	90 min
EAI-11[1),2)]	Physics 1	EAI 3104		5			5							6	SU/Ü/Pr		schrP	90 min
EAI-123)	German B2	EAI 3105		8			8							10	SU/Ü/Pr	Passed German B1 exam , 75% compulsory attendance	schrP	120 min
EAI-134)	Compulsory elective module (AWP)	EAI 3106	AWP 2	2			2							2	SU/Ü/Pr		5)	
EAI-14	Statistics and Stochastic	EAI 4101		4				4						5	SU/Ü		schrP	90 min
EAI-15	Basics of AI for Engineers	EAI 4102		4				4						5	SU/Ü		schrP	90 min
EAI-16	Control Technology 1	EAI 4103		4				4						5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-17	Electrical Measurement Technology	EAI 4104		8				8					6	6	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-18[1),2)]	Physics 2	EAI 4105		5				5						5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-19	Basics of Machine Learning for Engineers	EAI 4106		4				4						5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-20	Computer Technology	EAI 5101	Microcomputer Technology	4					4				5	9	SU/Ü/Pr		PStA	
		EAI 5102	Real-time Systems [1),2)]	3					3				4		SU/Ü/Pr		schrP	90 min
EAI-21	Digital Signal Processing	EAI 5103		4					4					5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-22	Databases	EAI 5104		4					4					5	S/SU/Ü		schrP	90 min
EAI-23	Industrial and Automotive Bus Systems	EAI 5105		4					4					5	S/SU/Ü/Pr	80% eTn	schrP	90 min
EAI-24	Electronic Components and Circuits	EAI 5106		4					4					5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-25	Internship	EAI 6101	Internship	x						x			23	25	Pr			
		EAI 6102	Practical seminar	2						2			2		S		(1) Presentation, (2) written report of at least 10 pages DIN A4	15 min
EAI-26	Practical Courses Taught as Seminars (PLV)	EAI 6103	PLV1	2						2			2.5	5	SU/Ü		eTN	
		EAI 6104	PLV2	2						2			2.5		SU/Ü		eTN	
EAI-27	Basics of Integrated Circuits and System	EAI 7101		4							4			5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-28	Future Optoelectronics	EAI 7102		4							4			5	SU/Ü/Pr		schrP	90 min
EAI 29	Prototyping of AI Systems	EAI 7103		4							4			5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-30	Intelligent Sensor Technology	EAI 7104		4							4			5	SU/Ü/Pr		schrP	90 min
EAI-31	Embedded Hardware Development and PCB Design	EAI 7105		4							4			5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-32	Compulsory Elective Module (FWP)	EAI 7106	FWP 1	4							4			5				
EAI-33	Bachelor's Module	EAI 8101	Bachelor's thesis	x								x	12	14	BA		BA	
		EAI 8102	Seminar	2								2	2		S		mP	30 min
EAI-34	Current Topics in Electrical Engineering and Information Technology	EAI 8103		4								4		5	SU/Ü/Pr	TN Practical course	schrP	90 min
EAI-35	Compulsory Elective Module (FWP)	EAI 8104	FWP 2	4								4		5				
EAI-36	Key Qualifications	EAI 8105	Business Administration	2								2		3	SU		schrP	90 min
		EAI 8106	Scientific Working Methods	2								2		3	SU/ S		PStA	
	Total SWS			173	25	24	27	29	23	6	24	15						
	Total ECTS			240	30	29	31	31	29	30	30	30		240				
as of 28/03/2024																		

Abbreviations:

ECTS	European Credit Transfer System	schrP	Written examination	Pr	Practical course/lab work
SWS	Weekly semester hours	mP	Oral examination	S	Seminar
ZV	Admission requirements	PStA	Written assignment	SU	Seminar-based lesson
1)	Basic modules	Präs	Presentation	Ü	Exercise class
2)	Language of instruction English	PB	Internship report		
3)	In lieu of the German course, native speakers of German are required to select a language course from the Language Centre catalogue which, where English is concerned, must be a level higher than B2.	eTN	Successful participation		
4)	to be selected from the Language Centre catalogue	BA	Bachelor's thesis		
5)	Both examination formats and their duration are specified in the catalogue of selectable elective (WP) courses	MA	Master's thesis		

Issued based on the resolution of the Faculty Council of the Faculty of Electrical Engineering and Information Technology of Deggendorf Institute of Technology dated 03 April 2024, the approval of the university management dated 08 May 2024, and the regulatory approval of the Vice President of Deggendorf Institute of Technology dated 30 September 2024.

Signed
Prof. Dr. Marcus Herntrei
Vice President

These by-laws were recorded at Deggendorf Institute of Technology on 30 September 2024. They were duly posted on 30 September 2024. Their day of announcement is therefore 30 September 2024.