

**Study and Examination Regulations for the
Bachelor Programme (Bachelor of Engineering, B. Eng.) of
Energy Systems Engineering (ESE) at the Deggendorf Institute of
Technology
of 01. October 2020**

On the basis of Art. 13 Para. 2 Clause 2, 58 Para. 1, 61 Para. 2 Clause 1 of the Bavarian University and College Act (BayHSchG) of 23rd May 2006 (GVBl. p. 245, Bay RS 2210-1-1-WK), last amended by § 1 Para. 186 of the Ordinance of 26th March 2019 (GVBl. p. 98), the Deggendorf Institute of Technology enacts the following by-laws:

**§ 1
Aim of the study programme**

- (1) The Bachelor programme of "Energy Systems Engineering (ESE)" aims to provide a broad-based interdisciplinary qualification in knowledge-intensive engineering based on scientific knowledge and methods through practice-oriented teaching. This applies, in particular, to the substitution of fossil fuels with renewable energies. In addition to imparting specialised knowledge in the field of engineering basics and renewable energies, core skills, which enable students to shape the change in energy systems from a fossil-fuel raw-material base to renewable resources, are also developed. The focus is on decentralised energy systems, energy networks and their operation and management.

The programme also aims at imparting the professional skills, methods expertise and social skills that enable independent application of acquired knowledge and skills, scientific knowledge and methods, and responsible action as an engineer in the field of energy systems.

- (2) Students also acquire social and international skills that enable them to act confidently and competently in the complex and inter-cultural economic environment, especially in the area of energy system transformation. International aspects and the expansion of language skills are of great importance given the increasing internationalisation of the economy. The programme focuses especially on imparting practice-oriented knowledge to facilitate the sustainable reorganisation of energy production. Along with a recommended stay of at least one semester abroad, students are well-prepared to meet the challenges of climate change with technical solutions that are required worldwide.
- (3) Through generalist education, which focuses on engineering disciplines, and with the supplementation of management skills and key qualifications in the area of sustainable entrepreneurial operations, students should be in a position to grasp overarching interrelations, respond flexibly and thus actively shape the transformation

of energy systems. Graduates are taught the ability to grasp the rapid change in technical progress, to help develop technical design and solution options, and to assess their technical suitability.

In addition, graduates should be able to evaluate technology concepts from the economic point of view and apply them for the company using economic principles. They should also be able to recognise the impact of decisions on business operations, employees and the environment, and take responsible action based on these factors.

(4) The Bachelor's programme is intended to enable engineering activities in the following fields of work:

- Development (conception, calculation, planning and building) of regenerative energy systems and smart grids using tools for spatial planning and modern geo-information systems
- Project planning (system design of sustainable energy systems including storage, supply and distribution technologies)
- Assembly, commissioning, servicing and maintenance
- Monitoring and assessment of regenerative energy systems using modern, digitised measuring and control technology
- Management of energy networks (electricity and gas) in different energy markets
- Lean management
- Sustainable corporate governance (CSR)
- Working in an international environment

(5) Importance is placed on wide-ranging and qualified interdisciplinary training, which enables graduates to seize a wide range of professional opportunities in commercial and utility companies, as well as in public services or in private practice. Training focuses on implementation-oriented teaching, taking into account the requirements of nationally and internationally operating industrial companies. It also prepares graduates for a subsequent management role in the company, as well as for their own independent work or company succession.

§ 2 Admission requirements

The general admission requirements for studying at a university in accordance with Art. 43, 45 of the Bavarian University and College Act (BayHSChG), in conjunction with the Ordinance on the Qualification for Studying at Universities in the Free State of Bavaria and at State-recognised Non-state Universities (Qualifikationsverordnung-QualV) (BayRS 2210-1-1-3-UK/WFK) as amended, must be met for the Bachelor's programme of Energy Systems Engineering (ESE).

§ 3 Standard period of study, structure of the programme, focus points

- (1) The standard period of study for the programme is seven semesters with six theory semesters and one practical semester. The fifth semester is the practical study semester.
- (2) The courses and examinations are conducted exclusively in English. The thesis can be written in German or English. Further details are set out in Annex 1 to the "Bachelor programme (ESE)".
- (3) From the fourth semester onwards, students can choose various modules from a pool of elective subjects, constituting a total of 15 ECTS credits.

§ 4 Modules

- (1) The programme comprises modules that can be composed of thematically-related courses. Each module is assigned ECTS credits that take into account the time required by students to complete the module.
- (2) The compulsory and elective modules, form of teaching, number of hours, exams and ECTS credits are set out in the annex to these by-laws. Regulations are supplemented by the curriculum for the general and subject-specific elective modules.
- (3) All modules consist of compulsory subjects, elective subjects or optional subjects:
 1. Compulsory modules are binding for all students.
 2. Elective modules are modules that are offered as alternatives to individuals or groups. Students must select certain modules from these in accordance with these study and examination regulations. Selected modules are treated as compulsory modules.
 3. Optional modules are modules that are not mandatory for achieving the study objective. Students can choose these from the courses offered by the university.
- (4) Modules can also be taught in blocks.
- (5) There is no claim that all available elective and optional modules will actually be offered. Likewise, there is no claim that the accompanying courses will be held when the number of participants is insufficient.

§ 5 Curriculum

The responsible faculty draws up a curriculum to safeguard the range of courses and to inform the students. Details of the course of studies are derived from this curriculum. The curriculum is decided by the Faculty Council and announced within the university before the semester starts. Changes or new regulations are announced, at the latest, at the beginning of the lecture period of the semester in which these changes are to be implemented for the first time. In particular, the curriculum contains regulations and information regarding

1. the time distribution of weekly semester hours per module and study semester including ECTS credits,
2. the description of the main subjects offered and their compulsory and elective modules, as well as the number of hours, type of course, study objectives and course content of these modules,
3. subject-specific elective modules with their number of hours,
4. the form of teaching in the individual modules, if they have not been definitively set out in the annex,
5. the study objectives and course content of individual modules (module hand-book),
6. the goals and contents of practical work and the courses accompanying the internships in the practical semester, as well as their form and organisation.

§ 6 Departmental student advisory service

Students who have not obtained 40 ECTS credits even after two semesters are advised to make use of the departmental student advisory service.

§ 7 Test in fundamentals and orientation

By the end of the second semester, students must have taken the module examination for the following modules for the first time

- ESE-01 Analytical basics of engineering studies
- ESE-03 Engineering informatics I
- ESE-04 Physics
- ESE-05 Chemistry

§ 8

Practical study semester

- (1) The fifth semester of the course is intended to be a practical study semester. It comprises at least 20 weeks and includes an internship in a company, as well as accompanying courses as indicated in Annex 1.
In duly justified exceptional cases, proof of practical activity can be substituted by subject-related practical training. This is decided by the person in charge of practical training at the faculty.
- (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. When performing a military exercise, students need not make up for the interruption if it does not extend beyond 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.
- (3) Admission to the practical study semester requires that at least 90 ECTS credits have been obtained.

§ 9

Electronic examinations

A written exam can also be taken in electronic form (electronic exam/e-exam). E-exams are exams, whose creation and implementation and sometimes even evaluation is computer-aided. Before the exam, students are given ample opportunity to familiarise themselves with the electronic examination system. Data protection regulations must be observed.

§ 10

Violation of examination regulations

Carrying of unauthorised aids to the examination room, especially Internet-enabled mobile devices such as smartphones, smartwatches, tablets, etc., shall be punishable as an attempt to cheat.

§ 11

Assessment of examination performance

- (1) For successfully completed exams, ECTS credits are awarded in accordance with the annex.
- (2) There is an examination for each module. If a module examination consists of several examinations, the module grade is calculated from the arithmetic mean of the individual examinations or average of the individual examinations weighted according to the allotted ECTS credits. For the stipulated ECTS credits, see Annex – Overview of Modules. ECTS credits can be obtained only upon the successful completion of modules. The ECTS credits per course are used to calculate the module grade.
- (3) The overall examination grade is calculated by taking the weighted arithmetic mean of individual grades. The weight of an individual grade is the same as the number of ECTS credits allocated to the subject for which the grade was awarded.
- (4) In addition to the overall examination grade in accordance with Para. 2, a relative grade based on the numerical value attained is shown according to the ECTS user guide as per regulations contained in § 8 Para. 6 of the general examination regulations of the Deggendorf Institute of Technology.

§ 12

Bachelor thesis

- (1) In the Bachelor thesis, students should demonstrate their ability to independently apply the knowledge and skills, which they have acquired during their studies, to complex tasks.
- (2) Anyone who has obtained at least 150 ECTS credits can register for the Bachelor thesis.
- (3) The Bachelor thesis can be written in English or German. Topics are specified by faculty professors.
- (4) The Bachelor thesis must be prepared within 6 months.

§ 13

Certificate

A certificate of the passed Bachelor examination is issued in accordance with the respective sample in the annex to the general examination regulations of the Deggendorf Institute of Technology. The Bachelor examination certificate must indicate the final grades of individual module groups, as well as the grades of the modules introduced in the respective module group.

§ 14
Academic degree and diploma supplement

- (1) On successful completion of the Bachelor examination, the academic degree of "Bachelor of Engineering", abbreviated "B. Eng.", is awarded.
- (2) A certificate granting the academic degree is issued in accordance with the respective sample in the annex to the general examination regulations of the Deggendorf Institute of Technology.
- (3) The certificate is bilingual. A diploma supplement, which particularly describes the essential course content underlying the degree, the course of studies and the qualification obtained with the degree, is additionally included.

§ 15
Coming into effect

These study and examination regulations come into effect from 01.10.2020. They shall apply for all students who start their studies in Wintersemester 2020/21.

Annex 1: "Bachelor Energy Systems Engineering"

Bachelor ESE Energy Systems Engineering

ECTS / Semester	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
7	Bachelor thesis					Bachelor seminar			Grid Management			Site planning and GIS			Elective III																				
6	Power Grid Technologies		Energy Storage		Smart Systems and Technologies			Elective II			Project work III incl. Lab work in Energy Systems																								
5	Internship incl. PLV seminars																																		
4	Renewable Energies		Sustainability		Plant Engineering			Elective I			Project work II incl. Simulation and Design			AWP II		Foreign Language IV																			
3	Applied Mathematics		Energy Technology		Measurement and Control Engineering			Fundamentals of Energy Economy			Project work I incl. Scientific Writing			Foreign Language III																					
2	Mathematics for Engineering		Informatics for Engineering II		Electrical and Power Engineering			Lab work in Natural Sciences			Materials and Design		Intercultural Competences		AWP I		Foreign Language II																		
1	Analytical Principles of Engineering		Informatics for Engineering I		Fundamentals of Electrical Engineering			Physics			Chemistry		Foreign Language I																						

Electives:	Advanced Fluid and Energy Technology	Finance and Accounting	Operational Processes	Strategic Planning and Project Management
	Computer Simulation in Energy and Resource Economics	Health Safety Environment	Principles of Energy Systems Management	Technology and Intellectual Property Rights Management
	Energy and Ressource Efficiency	International Energy Regulations	Process Engineering	
	Energy Economy Policy	Modelling Theory	Process Optimization	
	Entrepreneurship	MRO-Strategies and Process Reliability	Safety and Security in Energy Systems	

Annex 2: "Curriculum: Bachelor - Energy Systems Engineering – (ESE)"

Bachelor Energy Systems Engineering			Semester hours per week (SWS)							ECTS	Type of lecture	Type of Exam	
Module No.	Course No.	Module / Course	SWS	1st Sem.	2nd Sem.	3rd Sem.	4th Sem.	5th Sem.	6th Sem.				7th Sem.
overview of module/course no., module and course description, SWS and ECTS													
ESE-01		Analytical Principles of Engineering Analytische Grundlagen des Ingenieurstudiums	4	4							5	SU/Ü	written exam 90 min.
ESE-02		Informatics for Engineering I Ingenieursinformatik I	4	4							5	SU/Ü	written exam 90 min.
ESE-03		Fundamentals of Electrical Engineering Grundlagen Elektrotechnik	4	4							5	SU/Ü/Pr	oral exam
ESE-04		Physics Physik	4	4							5	SU/Ü	written exam 90 min.
ESE-05		Chemistry Chemie	4	4							5	SU/Ü	written exam 90 min.
ESE-06		Foreign Language I Fremdsprache I	4	4							4	SU/Ü	written exam 90 min.
ESE-07		Mathematics for Engineering Ingenieurmathematik	4		4						5	SU/Ü	written exam 90 min.
ESE-08		Informatics for Engineering II Ingenieursinformatik II	4		4						5	SU/Ü	report / presentation
ESE-09		Electrical and Power Engineering Electro- und Energietechnik	4		4						5	SU/Ü/Pr	report / presentation
ESE-10		Lab work in Natural Sciences Laborarbeiten Naturwissenschaften	4		4						5	SU/Ü/Pr	report / presentation
ESE-11		Materials and Design Werkstoffe und Design	4		4						5	SU/Ü	written exam 90 min.
ESE-12		Intercultural competences Interkulturelle Kompetenzen	2		2						2	SU/Ü	report / presentation
ESE-13		Compulsory elective subject of a general academic nature (AWP) I Allgemeinwissenschaftliches Wahlpflichtfach (AWP) I	2		2						2	SU/Ü	written exam 60 min. or PstA
ESE-14		Foreign Language II Fremdsprache II	2		2						2	SU/Ü	written exam 60 min.
ESE-15		Applied Mathematics Angewandte Mathematik	4			4					5	SU/Ü	written exam 90 min.
ESE-16		Energy Technology Energietechnik	4			4					5	SU/Ü	written exam 90 min.
ESE-17		Measurement and Control Engineering Mess- und Regeltechnik	4			4					5	SU/Ü	written exam 90 min.
ESE-18		Fundamentals of Energy Economy Grundlagen der Energiewirtschaft	4			4					5	SU/Ü	written exam 90 min.
ESE-19		Project Work I incl. Scientific Writing Projektarbeit I inkl. wissenschaftliches Arbeiten	6			6					6	SU/Ü/Pr	report & presentation
ESE-20		Foreign Language III Fremdsprache III	4			4					4	SU/Ü	written exam 90 min.
ESE-21		Project Work II incl. Simulation and Design Projektarbeit II inkl. Simulation und Design	6				6				6	SU/Ü/Pr	report & presentation
ESE-22		Renewable Energies Erneuerbare Energien	4				4				5	SU/Ü	written exam 90 min.
ESE-23		Sustainability Nachhaltigkeit	4				4				5	SU/Ü	PstA
ESE-24		Plant Engineering Anlagenplanung	4				4				5	SU/Ü	written exam 90 min.
ESE-25		Compulsory elective subject of a general academic nature (AWP) II Allgemeinwissenschaftliches Wahlpflichtfach (AWP) II	2				2				2	SU/Ü	written exam 60 min. or PstA
ESE-26		Compulsory Elective I* Fachwissenschaftliches Wahlpflichtmodul I (FWP)	4				4				5	SU/Ü	written exam / report / presentation / oral exam
ESE-27		Foreign Language IV Fremdsprache IV	2				2				2	SU/Ü	written exam 60 min.
ESE-28		Internship including PLV seminars Praktikum inkl. PLV Seminare	30						30		30	Pr	internship
ESE-29		Power Grid Technologies Energienetz-Technologien	4						4		5	SU/Ü	written exam 90 min.
ESE-30		Energy Storage Energiespeicher	4						4		5	SU/Ü	written exam 90 min.
ESE-31		Smart Systems and Technologies Intelligente Systeme und Technologien	4						4		5	SU/Ü	written exam 90 min.
ESE-32		Compulsory Elective II* Fachwissenschaftliches Wahlpflichtmodul II (FWP)	4						4		5	SU/Ü	written exam / report / presentation / oral exam
ESE-33		Project Work III incl. Lab Work in Energy Systems Projektarbeit III incl. Laborarbeit Eneroetechnik	8						8		10	SU/Ü/Pr	report & presentation
ESE-34		Grid Management Energienetzmanagement	4							4	5	SU/Ü	written exam 90 min.
ESE-35		Site Planning and GIS Standortplanung und GIS	4							4	5	SU/Ü	written exam 90 min.
ESE-36		Compulsory Elective III* Fachwissenschaftliches Wahlpflichtmodul III (FWP)	4						4		5	SU/Ü	written exam / report / presentation / oral exam
ESE-37		Bachelor thesis Bachelorarbeit	14								15		
	7104	Bachelor thesis incl. final presentation Bachelorarbeit inkl. Abschlussvoräsentation								10	12	BA	Bachelor Thesis
	7105	Bachelor Seminar Bachelor Seminar								4	3		TN 50%
		Total SWS	24	26	26	26	30	30	24	26	182		
		Total ECTS	29	31	30	30	30	30	30	30	210		
Abkürzungen:													
BA	Bachelor Thesis		Report/Präsentation			Report Limit 10 DIN A4 pages / presentation limit 30 minutes							
ECTS	European Credit Transfer System		SU			Seminar-style lesson							
Pr	Internship		Ü			Practical Exercise							
PA	Project work incl. Report		SWS			Semester hours per week							
schrP	Written exam		FWP			compulsory elective							
S	Seminar		AWP			Compulsory elective subject of a general academic nature							
PstA	Research and Examination Paper		TN 50%			Participation of at least 50%							

"Pool of Compulsory Electives I-III":

Advanced Fluid and Energy Technology / Fortgeschrittene Fluid- und Energietechnik (written exam 90 min.)
 Computer Simulation in Energy and Resource Economics / Computersimulation in der Energie- & Ressourcenökonomie (report/presentation)
 Energy and Resource Efficiency / Energie- und Ressourceneffizienz (written exam 90 min)
 Energy Economics Policy / Energiewirtschaftspolitik (report/presentation)
 Entrepreneurship / Gründungsmanagement (report/presentation)
 Finance and Accounting / Finanzierung und Rechnungswesen (report/presentation)
 Health Safety Environment / Gesundheit Sicherheit Umwelt (report/presentation)
 International Energy Regulations / Regulierung im Energiemarkt (report/presentation)
 Modelling Theory / Modellierungstheorie (written exam 90 min)
 MRO-Strategies and Process Reliability / Instandhaltungsstrategien und Prozesssicherheit (written exam 90 min.)
 Operational Processes / Betriebliche Abläufe (written exam 90 min.)
 Principles of Energy Systems Management / Prinzipien des Energiesystemmanagements (written exam 90 min.)
 Process Engineering / Verfahrenstechnik (written exam 90 min.)
 Process Optimization / Prozessoptimierung (written exam 90 min.)
 Safety and Security in Energy Systems / Sicherheit in Energiesystemen (report/presentation)
 Strategic Planning and Project Management / Strategische Planung und Projektmanagement (report/presentation)
 Technology and Intellectual Property Rights Management / Technologie- und Schutzrechtsmanagement (report/presentation)

***Compulsory Elective I-III:**

Students must acquire 15 ECTS credits from the "Pool of Compulsory Electives I-III".

**Annex 3:
Compulsory Attendance for the Bachelor Programme of Energy Systems Engineering at the Deg-
gendorf Institute of Technology/European Campus Rottal Inn**

Module	Course	Reason for compulsory attendance	Required attendance	Consequences
ESE-19	Project work I including scientific work	Projects and practical set-ups can be executed only if active participation is guaranteed.	Minimum 75% of the offered courses. Substitution tasks are possible in justified cases of absence.	Students will be considered as failed in project work
ESE-21	Project work II including simulation and design	Projects and practical set-ups can be executed only if active participation is guaranteed.	Minimum 75% of the offered courses. Substitution tasks are possible in justified cases of absence.	Students will be considered as failed in project work
ESE-33	Project work III incl. laboratory work in the field of energy technology	Projects and practical set-ups can be executed only if active participation is guaranteed.	Minimum 75% of the offered courses. Substitution tasks are possible in justified cases of absence.	Students will be considered as failed in project work
ESE-37	Bachelor seminar	A Bachelor thesis can be presented effectively only by using communication techniques.	Minimum 50% of the offered courses. Substitution tasks are possible in justified cases of absence.	Students will be considered as failed in the Bachelor seminar