

Qualification goals

Bachelor Industrial Engineering

**Faculty European Campus Rottal-Inn
of the Deggendorf Institute of Technology**

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Gender neutrality

The use of double forms or other markings of female, male and diverse gender is largely avoided in order to maintain legibility and clarity. All titles for the various groups of members of the university refer equally to members of all genders of the groups concerned.

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1 Objectives of the programme

The Bachelor programme Industrial Engineering aims to provide a broad-based interdisciplinary qualification in knowledge-intensive engineering and business administration based on scientific knowledge and methods through practice-oriented teaching. The programme also aims to impart the professional, methodological and social skills that enable the independent application of engineering and scientific knowledge and procedures as well as responsible action in business and society both as an employee and an entrepreneur.

Students also acquire international competencies and the skills to work with assistive digital technologies that help them operate confidently and work competently in the complex and inter-cultural environment of management, especially of energy and resource management. International aspects and the expansion of language skills are of great importance given the increasing internationalisation of the economy. The technical focus of the course is thus on imparting practice-oriented knowledge for a sustainable industrial society. Combined with a recommended stay abroad of at least one semester, students are optimally equipped to meet the challenges of engineering with technical solutions that are needed worldwide.

Attention is paid to wide-ranging, qualified and interdisciplinary training, which enables graduates to work in a variety of professions. The training focuses on implementation-oriented teaching, taking into account the requirements of small and medium-sized companies.

2 Learning outcomes of the programme

Equipped with generalist training that focuses on engineering subjects and that is supplemented by business administration related content, legal basics and key qualifications in entrepreneurship, students should not only acquire knowledge of business administration and technical knowledge but also be able to grasp overarching relationships, respond flexibly and lead people. Graduates should be enabled to grasp the rapid change in technical progress, help develop technical design and solution possibilities and assess their technical practicality, evaluate technical concepts economically and use them for the company based on economic principles as well as recognise the impact of decisions on business activities, employees and the environment and act responsibly with that in view.

3 Study objectives and qualification goals

Knowledge:

Graduates acquire extensive knowledge of mathematics, science, engineering and business administration. Theoretically acquired knowledge can be implemented in a practical and solution-oriented manner. Graduates know the terms and methods relevant to different fields. Due to the knowledge of business administration that is acquired, graduates have the necessary know-how to set up and manage companies. Graduates can research and interpret academic technical texts and apply them to situations in everyday work.

Skills:

- Students have sound basic knowledge of the fundamentals of mathematics and science, mechanics and information technology as well as business administration and economy.
- In addition, they have in-depth knowledge of:
 - Development (conception, calculation, planning and construction) of energy and production plant technology and process technology
 - Project planning of plants
 - Monitoring and assessment of sustainable technologies, especially in the field of renewable energies and energy systems using modern, digitised measurement and control technology
 - Personnel and quality management, taking legal requirements into account
 - Application of statistical methods for data evaluation
 - Analysis and evaluation of problems in company information systems
 - Lean management
 - Sustainable corporate governance
 - Working in an international environment
- Students can assess their range of services, identify further training measures and work together internationally, even in large teams.
- They can analyse and evaluate engineering-related problems and develop appropriate solutions.

Competencies:

- Students can research and interpret academic technical texts and apply them to situations in everyday work.
- They can solve problems in an application-oriented manner using basic methods.
- Students can present work results in a structured manner and discuss them in front of expert audience.
- They can think and act in an entrepreneurial way and formulate strategies.
- They should be able to grasp overarching relationships and respond flexibly.
- Students can implement theoretically acquired knowledge in a practical and solution-oriented manner.
- Students can organise themselves and show a capacity for teamwork and leadership skills during interdisciplinary cooperation.
- They can evaluate technical concepts economically and use them for the company based on economic principles as well as recognise the impact of decisions on business activities, employees and the environment and act responsibly with that in view.
- Students can name stakeholders of companies and classify their relevance for product development and take their goals into account.
- They can reflect on their actions and adapt them to suit ethical, ecological, social and economic requirements.
- Students learn to assess their strengths and weaknesses and their impact on others.
- They can contribute to conflict resolution and handle criticism constructively.
- Students recognise the need for lifelong learning and acquire the necessary skills.

4 Learning outcomes of modules/module objectives/matrix of objectives

Individual modules, their detailed objectives and competencies to be acquired by graduates are described in the module handbooks for the Bachelor programme.

The following table shows the relationship between individual modules and the objectives described in the previous section for the Bachelor programme of Industrial Engineering.

Matrix of objectives of the modules in the Bachelor programme Industrial Engineering														
Module	Objectives													
	Knowledge					Skills					Competencies			
	Scientific and Technological Basics	Engineering Science	Business Administration	Engineering Practice and Product Development	General	Scientific and Technological Basics	Engineering Science	Business Administration	Engineering Practice and Product Development	General	Scientific and Technological Basics	Engineering Science	Business Administration	Engineering Practice and Product Development
Semester 1														
Analytical Principles of Engineering		XX					XX					XX		
Informatics for Engineering I		XX					XX					XX		
Technical Mechanics I		XX					XX					XX		
Accounting					XX				XX				XX	
Principles in Business					XX				XX				XX	
Foreign Language I					XX				XX					XX
Semester 2														
Mathematics for Engineering		XX					XX					XX		
Informatics for Engineering II		XX					XX					XX		
Technical Mechanics II		XX					XX					XX		
Business Law				X	XX			X		XX			X	XX
Physics	XX					XX				XX				
Lab Work in Physics	XX			X		XX			X		XX			X
Foreign Language II					XX					XX				XX
Compulsory elective subjects of a general academic nature (AWP) I					XX					XX				XX
Semester 3														
Applied Mathematics		XX					XX					XX		
Fundamentals of Electrical Engineering		XX					XX					XX		
Energy Technology		XX					XX					XX		
Scientific Writing, Research Methods and Project Management					XX					XX				XX
Chemistry	XX					XX				XX				
Lab Work in Chemistry	XX			X		XX		X		XX		X		
Foreign Language III					XX					XX				XX

Module	Objectives														
	Knowledge					Skills					Competencies				
	Scientific and Technological Basics	Engineering Science	Business Administration	Engineering Practice and Product Development	General	Scientific and Technological Basics	Engineering Science	Business Administration	Engineering Practice and Product Development	General	Scientific and Technological Basics	Engineering Science	Business Administration	Engineering Practice and Product Development	General
Semester 4															
Financing			XX					XX					XX		
Logistics and Operations Research			XX					XX					XX		
Renewable Energies	X	XX			X	X	XX			X	X	XX			X
Plant Engineering		XX		X			XX		X			XX			X
Compulsory elective subjects of a general academic nature (AWP) II					XX					XX					XX
Foreign Language IV					XX					XX					XX
Fundamentals of Measurement and Control Engineering		XX					XX					XX			
Semester 5															
Applied Measurement and Control Engineering		XX		X			XX		X			XX	X		
Process Reliability		XX					XX					XX			
Inter-cultural Competences					XX					XX					XX
Sustainability	X			X	X	X		X	X		X			X	X
Management			X	X	XX			X	X	XX			X	X	XX
Project Work	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Semester 6															
Internship			X	XX	X			X	XX	X			X	XX	X
PLV I				X	XX					XX					XX
PLV II				X	XX					XX					XX
Semester 7															
Compulsory Elective I		X	X	X			XX					XX			
Compulsory Elective II		X	X	X			XX					XX			
Compulsory Elective III		X	X	X			XX					XX			
Bachelor Thesis			X	X	XX			X	X	XX			X	X	XX
Applied Communication Techniques					XX					XX					XX

Legend: xx strong relation; x medium relation

Compulsory Electives:	
Engineering	Process Engineering / Verfahrenstechnik Data Acquisition and Processing / Datenerfassung und -verarbeitung Industrial Automation and Information Technology / Industrielle Automatisierung und Informationstechnologie Modelling Theory / Modellierungstheorie Energy and Resource Efficiency / Energie- und Ressourceneffizienz Process Optimization / Prozess Optimierung
Business	Globalisation / Globalisation Energy Markets / Energiemärkte Business Planning and Start-Up Management / Businessplanung und Gründungsmanagement Operational Processes / Betriebliche Abläufe