Qualification goals

Bachelor Software Design

Faculty of Computer Science

at Deggendorf Institute of Technology

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Gender neutrality

The use of double forms or other labels for persons of female, male and diverse genders has been avoided to a large extent for the sake of better readability and clarity. All names for the different groups of university members refer equally to members of all genders of the respective groups.

As of 17 January 2024

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1 Qualification goals

The aim of this specialised Software Design degree programme, which qualifies students for a career in the field, aims to provide training through practice-oriented teaching, which will enable students to work as computer scientists in their own right. Graduates shall be able to design and implement all types of software systems.

The programme may be completed in the dual study mode while gaining intensive practice experience. In this case, the practical phases take place in the lecture-free periods, during the internship semester and when writing the bachelor's thesis in a partner company. During the university semester, students of the dual study mode are offered specific courses, where they can put theory into practice and where theory and practice are combined. These are specified and described in the annex to these by-laws and in the module handbook.

Career opportunities are available not only in commercial and utility companies, but also in public sector administrations and in private practice. Some of the target areas for graduates are industry and production, software companies, building automation, mobility, ecoinformatics, medical technology, mobile care or logistics or founding and developing IT companies.

2 Learning outcomes of the programme

The programme is designed to enable graduates to take on typical tasks of a computer scientist in the areas of research and development, and project implementation in the industry. It also qualifies them to work in the public sector, in administration, as a consultant or independent expert and to become self-employed. The programme, which has a total of 210 ECTS credits, consists of six theoretical semesters (180 ECTS credits) and one practical semester (30 ECTS credits) as an industrial internship. In the theoretical semesters, students are taught the basics of mathematics and natural sciences in the mathematics modules and the basics of computer science, among others, in the following modules: Basics of Computer Science, Programming 1, Programming 2, Algorithms and Data Structures, Network Technology and IT Networks, Operating Systems and Databases. Students can also earn credits in interdisciplinary key qualification modules (such as Media Competence and Self-organisation, Business Administration, Technical Ethics and Sustainability, Scientific Working Methods, Rhetoric and English for Engineers).

The following table assigns learning outcomes to the stated study objectives of Software Design bachelor's programme.

Table 1: Learning outcomes of the Software Design bachelor's programme	
1. Basics in the most important areas of mathematics and computer science	Knowledge: Students learn basic mathematical and computer science terms and methods.
	Skills: Based on their knowledge and methods, students can analyse problems professionally and develop appropriate solutions.
	Competencies: Students can apply the essential methods of mathematics and computer science.
2. Logical thinking, analytical skills and technological expertise	Knowledge: Students specialise in the general basics of software development.
	Skills: They can analyse and evaluate problems in the area of software development. They can apply software development processes to new problems.
	Competencies: Students can analyse problems relating to the development of complex software applications.
3. Software systems in applications	Knowledge: Students specialise in the general basics of various areas of application.
	Skills: They can analyse and evaluate problems in various areas of application. They can apply software development processes to new problems in various areas of application.
	Competencies: Students can analyse problems relating to the development of software systems in the areas of application.
4. Interdisciplinary skills	Knowledge: Students recognise the economic, legal and ethical framework conditions for the development and use of software systems

	Skills: Students are able to form their own opinions and present them clearly using professional English.
	Competencies: Qualified influence on the development of new software systems in compliance with the various framework conditions. Working on technical tasks in English as part of a team.

3   Learning outcomes of modules/module objectives

Individual modules, their detailed objectives and skills to be acquired by graduates are described in the module handbooks for the Software Design bachelor's programme. Here, the modules are listed in the sequence of the module numbers of the respective study and examination regulations (StPO).

The following table shows the relationship between individual modules and the objectives described in the previous section for the Software Design bachelor's programme.

Table 2: Goals matrix of the modules in the Software Design bachelor's programme

Modules	Goals											
	Knowledge				Skills				Competencies			
	Basics	Technological expertise	Applications	Soft Skills	Basics	Technological expertise	Applications	Soft Skills	Basics	Technological expertise	Applications	Soft Skills
1st semester												
Mathematics 1	xx				xx				x			
Programming 1	xx				xx				xx			
Basics of Computer Science	xx				xx				xx			
Operating Systems and Networks	xx				xx				x			
Digital Technology and Computer Organisation		xx				xx				xx		
Key qualification 1				xx				xx				x
2nd semester												
Mathematics 2	xx				xx				x			
Programming 2	xx				xx				xx			
Algorithms and data structures	xx				xx				xx			
Operating Systems and Networks 2		xx				xx				x		

	1	2	3	4	5	6	7	8	9	10	11	12
Internet Technologies	xx				xx				x			
Key qualification 2				xx				xx				x
3rd semester												
Databases	xx				xx				x			
Stochastics	xx				xx				x			
Project Management	x				xx				xx			
Modern Programming Paradigms		xx				xx				x		
HCI (Human Computer Interaction)			xx				xx				x	
Key qualification 3				xx				x				x
4th semester												
Databases 2		xx				xx				x		
Cloud Computing			xx				xx				x	
IT Security		xx				xx				xx		
FWP 1		xx				xx				xx		
Software Engineering	xx				xx				x			
Key qualification 4				xx				xx				x
6th semester												
SE Project 1			xx				xx				x	
Computer Science Seminar			xx				xx				x	
Systems Engineering			xx				xx				xx	
Software Engineering 2		xx				xx				xx		
FWP 2				xx				x				x
7th semester												
SE Project II			xx				xx				x	
FWP 3			xx				xx				x	

Legend: xx strong relation;   x medium relation