

# Qualification Goals

## Bachelor Building Products and Processes (BPP) / Bauprodukte und -prozesse

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### **Gender neutrality**

The use of double forms or other designations of female, male and other genders has been largely avoided in order to maintain legibility and clarity. All designations given to the various groups of university staff apply equally to all genders of the relevant groups.

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## **1 Aims of the degree programme**

The degree programme aims to cover the new array of building construction services. It seeks to provide students with qualifications in the digital building process as well as the development of internationally marketable building products. At the same time, the overriding dictum is to prepare students to perform responsible tasks related to the future challenges concerning building upgrades and structural engineering and thus the challenges that must be met in terms of social and human needs in the working environment.

Students will additionally be empowered to present their acquired skills and expertise in fluent English. Foreign students will additionally acquire a working knowledge of German to enable them to work in German companies.

## **2 Learning outcomes of degree programme**

The "Building Products and Processes" degree programme provides the hands-on, multi-faceted and international outlook that is required in order to plan medium-sized and large-scale civil engineering projects. At the same time, a BPP engineer is completely accustomed to the complex building systems of a building structure (concrete, masonry, steel and timber and hybrid constructions as well as building envelopes (roofing and façade) and interior construction (floor/ceiling/walls). Technical finishing trades (building automation/heating/ventilation/plumbing) as well as their interfaces to the finishing trades are further elements of their work activities. The fields of expertise that students acquire as part of the "Building Products and Processes" degree programme are described as follows.

### **Building products expertise**

The building trades described under DIN 276, covering cost groups 330 to 430 and 480, are covered in every element in this programme. This not only involves new builds but, in particular, also existing constructions, which can be additionally brought to intelligent lightweight constructions, new as well as forward-thinking building uses.

The building structures require structural components and materials which must meet the constantly rising product demands (architectural, ecological, sustainable, as well as the national building regulations). Accordingly, students will have a command

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of all steps required in order to understand building product development as a means of bringing it to market on national and/or international target markets and/or applying it in the building sector in general.

### **Building processes expertise**

The building industry is facing a major step forward – the digitisation of building processes. In future, BIM (Building Information Modelling) will encompass the holistic modelling of the building structure, including all its building characteristics as well as the use of the centralisation of project data and knowledge. The building process chain is thus linked to the digital environment. Digitalisation thus not only impacts the planning of building structures but, above all, also the building processes themselves. In this regard, students are given the opportunity to handle the building-related processes (from the offer to the final invoice) and align them to the digital requirements (BIM 4-D to BIM 6-D).

### **Language expertise-**

The international character of the project work and construction building development necessitates solid English language skills. In terms of building product development, the ability to study English language literature, building regulations, EN standards etc. are all part and parcel of the daily business. The use of English during the degree modules enables students to understand the corresponding building descriptions and technical documents and to coordinate and conduct the building work in English.

## **3 Study objectives and qualification goals**

### **Knowledge**

Upon concluding the degree programme, students will have acquired the following knowledge and expertise:

- Students will avail of broadened and extensive specialist, application-relevant knowledge of all standard components and building products and be familiar with production, processing and usage methods as well as methods relating to recyclable demolition.
- Students will have acquired in-depth knowledge of the trades involved in creating building structures in accordance with the DIN 276 standard as well as cost groups 330 to 430 and 480 and will be familiar with the linkages and

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dependencies involved in the project planning/management of new builds, redevelopments, renovations and demolition.

- Students will be aware of the specifications and procedure involved in developing, bringing to market, distributing or utilising building products and will be familiar with the relevant national and international laws, standards, regulations and guidelines.
- Students will be aware of what is required and possible when introducing, applying and refining digitisation in building processes.
- Graduates will acquire the ability to work independently and act responsibly and sustainably in their respective fields of competencies.
- They will recognise the need to constantly refine changing work and learning content.
- Graduates will know the terminology and methods of relevance to the various fields (building products, BIM).
- Students will be able to assess their scope of services, recognise further training measures and work with others internationally, including in large groups.
- Students will be able to analyse and assess product-specific and process-specific issues, develop solutions to resolve them and justify these using sound arguments.

**Skills**

Graduates will acquire the following skills:

- Students will be able to research and interpret project-specific, legal, normative as well as other specialist texts and apply these to situations falling under the field of competence of building processes and building products.
- Students will be able to resolve problems by applying their application-based knowledge as well as scientific methods and further refine these.
- They will be in a position to comprehend, apply and professionally analyse new, digital problem-solving methods.
- Students will be able to present work outcomes in a structured fashion and confidently discuss them in front of an international audience comprising professionals (architects, project planners and controllers, testing and standardisation bodies, suppliers, client representatives).

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- They will be in a position to use and refine their judgement to develop practical solutions and concepts, including to new, unknown issues and problems.
- Students will have learned to assess their own strengths and weaknesses as well as their impact on others.
- Students will be able to bring about resolution to conflicts and constructively handle criticism.
- Students will have recognised the need for lifelong learning and acquired the skills to do so.
- They will be able to categorise knowledge from a variety of fields and combine this knowledge as required when finding solutions to complex problems.

#### **Competencies**

Students will be equipped with the following competencies upon completing the degree programme:

- Students will be able to apply the theoretical knowledge that they have acquired both outcome-oriented and to real-world situations, and when developing and marketing and/or planning and executing building projects.
- Students will be able to think and act as entrepreneurs and formulate strategies.
- Students will be able to express themselves in fluent written and spoken English, German and, where applicable, a further foreign language, and conduct negotiations in these languages.
- Students will be able to organise themselves without assistance and exhibit an ability to work in a team as well as leadership skills in interdisciplinary work environments.
- Students will be able to research and interpret specialist and standardisation texts and apply these to everyday situations within the institution or company.
- Students will be able to comprehend, design and implement digital process models.
- Students will be able to name corporate stakeholders, categorise their relevance for product development and the execution of construction work, and factor in their objectives.

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- Students will be able to reflect on and align their actions to ethical, ecological, social and economic needs.

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

The individual modules, their detailed goals, and the skills and competencies to be acquired by the graduates are outlined in the module handbooks for the Bachelor degree programme.

The table below establishes the links between the individual modules and the Bachelor degree objectives outlined in the text above.

<b>Objectives matrix - BBP degree programme modules</b>												
Module	Objectives											
	Knowledge				Skills				Competencies			
	Scientific and Technological Basics	Engineering-based methods	Engineering Practice and Product Development	General	Scientific and Technological Basics	Engineering-based methods	Engineering Practice and Product Development	General	Scientific and Technological Basics	Engineering-based methods	Engineering Practice and Product Development	General
<b>Semester 1</b>												
Engineering Mathematics		xx				xx				x		
Fundamentals of Building Physics 1	xx				xx				x			
Construction Chemistry	xx				xx				x			
Structural Engineering		xx				xx				x		
Building Informatics		xx				xx				x		
Workshop Architecture				x				x				x
Technical English / Technical German				xx				xx				xx
<b>Semester 2</b>												
Fundamentals of Building Physics 2	xx				xx				x			
Fundamentals of Building Physics 3	xx				xx				x			
Building Material Characteristics		xx				xx				xx		
CAD 2D/ 3D (BIM)		xx				xx				xx		
Intercultural Competences and Management Skills				x				x				x
<b>Semester 3</b>												
Law 1			x				x				x	
Construction Calculation		xx				xx				xx		
Project Management 1			xx				xx				xx	
Project Management 2			xx				xx				xx	
Digital Building Process		xx				xx				xx		
Scientific Methods												
<b>Semester 4</b>												
Commercial Management		xx				xx				xx		
Law 2			x					x			x	

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Module	Objectives											
	Knowledge				Skills				Competencies			
	Scientific and Technological Basics	Engineering-based methods	Engineering Practice and Product Development	General	Scientific and Technological Basics	Engineering-based methods	Engineering Practice and Product Development	General	Scientific and Technological Basics	Engineering-based methods	Engineering Practice and Product Development	General
Product Management 1			xx			xx				xx		
Product Development and Tests		xx			xx				xx			
Construction Material Tests		xx			xx				x			
Seminar on Project Management			xx				xx			xx		
<b>Semester 6</b>												
Building Trades 1			xx				xx				x	
Building Trades 2			xx				xx				x	
Building Trades 3			xx				xx				x	
Building in Existing Structures			xx				xx				x	
Seminar on Product Development			xx				xx				x	
<b>Semester 7</b>												
Product Management 2			xx				xx				x	
Green Building			xx				xx				x	
English 2 (Negotiations)				xx				xx				xx

**Legend:** xx strong relation; x medium relation