Qualification goals
Master Healthy and Sustainable Buildings

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 Master programme of HSB makes it possible to acquire a second degree based on a first higher education degree qualifying for entry into a profession. It should qualify students in methods and technologies in the fields of healthy and sustainable buildings, combined with applications in various areas of the construction and real estate industries and familiarise them with the different application areas of professional engineering and architecture practice. It takes into account the existing experience of students from undergraduate courses and their professional practice and reinforces these experiences.

The Master programme of HSB aims to enable graduates of a Bachelor or Diploma programme to reinforce knowledge gained so far with theoretical knowledge and, through the interdisciplinary range of subjects, to expand the horizon of knowledge such that they are capable of holistic considerations and analyses in the future. The aim is to enable graduates to work creatively in planning offices as well as in research and development departments. In addition, particularly qualified students should acquire theoretical foundations that enable them to pursue a doctorate or work in academic fields. In particular, the programme is geared towards the goal of enabling students to independently work on specific development and application tasks in the field of architecture and engineering in the working environment of a globalised (construction) industry.

Students should be enabled to develop holistic and sustainable solutions as international planners and/or consultants within the framework of interdisciplinary teams and, if necessary, to coordinate and guide appropriate teams using their comprehensive and broad-based knowledge.

2 Learning outcomes of the programme

The Master programme deepens and expands theoretical and application-oriented knowledge and skills relevant to the fields of engineering and architecture. The knowledge and skills that students possess based on their regional experiences are analysed, placed in a regional, national and international context and supplemented specifically with German and international experiences, concepts, approaches and technologies.

Students of the Master programme acquire the ability to do independent academic work, which is also supported by the module "Advanced Quantitative and Qualitative Research Methods" and the research activities of the faculty and lecturers. Students gain knowledge of methodological concepts and current research literature.

Fundamentals of healthy and sustainable construction are applied to real problems that are derived from research projects and experiences within the faculty in order to develop expertise and competencies for problem solving in the areas of sustainable buildings and environments, building simulations including building safety and security, refurbishment & renovation as well as ambient assisted living. Furthermore, the ability to familiarise oneself quickly and systematically with new areas is developed.

3 Study objectives and qualification goals

Knowledge:

Graduates acquire in-depth and extensive knowledge of engineering, science and architecture. They are capable of independent academic work and responsible action. They recognise the need for continuous further development with changing work and learning content. Graduates know the terms and methods relevant to different fields. Furthermore, they know how to handle and design projects.

Skills:

Students have in-depth and application-relevant specialist knowledge of "healthy and sustainable buildings".

- They have in-depth knowledge of:
  - Planning and simulation of healthy and sustainable buildings and neighbourhoods, taking health factors into account.
  - Refurbishment, renovation and maintenance of buildings and performing assessments on safety, hazard control, health, productivity, investment costs and operating and maintenance costs.
  - Standards and certifications of sustainable buildings (KfW standards, DGNB, LEED, ASHRAE manual, etc.).
  - Building physics and building climatology of different climate zones and building cultures and traditions including macro and microanalysis, heat/cold, acoustics, artificial lighting/daylight/shade, natural ventilation, noise protection.
  - Environment analysis methods in building-related areas with a focus on monitoring and analysis of physical, chemical and biological factors.
  - Building security and building protection and the understanding of the relationship between design decisions, health, productivity and investment costs.

  - Analysis of projects with respect to intelligent infrastructures and artificial intelligence.
- Students can assess their range of services, identify further training measures and work together internationally, even in large teams.
- Students can analyse and evaluate engineering and architecture related problems from the field of healthy and sustainable buildings and develop appropriate solutions.

Competencies:

Graduates acquire the competencies to

- Methodically classify and systematically combine knowledge from various fields and handle complexity.
- Use their knowledge and skills for the optimum design of healthy and sustainable buildings.
- Develop new and innovative products.
- Lead and shape teams and evaluate their deliverables and performances.
- Quickly, methodically and systematically learn the ropes of new, unknown tasks.
- Evaluate the application of new technologies and methods and assess their limitations.
- Systematically reflect on non-technical impacts of engineering activities as well and use these findings responsibly when they work.
- Evaluate the effectiveness and efficiency of existing methods and, if necessary, develop them further scientifically with the aim of drawing up optimally adapted solutions.
- Conceptualise, execute and analyse detailed theoretical and experimental investigations of technical issues.
- Present their ideas and findings orally and in writing in accordance with academic standards.

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 Master programme.

The following table shows the relationship between individual modules and the objectives described in the previous section for the Master programme of Healthy and Sustainable Buildings.

Matrix of objectives of the modules in the Master programme of Healthy and Sustainable Buildings

Module	Objectives											
	Knowledge				Skills				Competencies			
	Scientific and Technological Basics	Engineering-based Methods	Engineering Practice and Product	General	Scientific and Technological Basics	Engineering-based Methods	Engineering Practice and Product	General	Scientific and Technological Basics	Engineering-based Methods	Engineering Practice and Product	General
Semester 1												
Environmental Psychology				xx				xx				xx
Sustainable Buildings & Neighbourhoods	xx	xx	x		x	xx			x	xx		
Smart Buildings	xx	xx	x		xx	xx	x		xx	xx	x	
Advanced Quantitative and Qualitative Research Methods				xx				xx				xx
Semester 2												
Environmental Hygiene and Medicine	xx			x	xx			x	xx			x
Evidence Based Design 1	x	xx	xx	x	x	xx	xx	x	x	xx	xx	x
Standards & Green Building Certification Systems	x	x	x	xx	x	x	x	xx	x	x	x	xx
Building Performance Simulations	x	xx	xx		x	xx	xx		x	xx	xx	
Refurbishment & Renovation	x	xx	xx	x	x	xx	xx	x	x	xx	xx	x
Project Management and Implementation	x	x	x	xx	x	x	x	xx	x	x	x	xx
Semester 3												
Sustainable Energy Supply Systems	xx	xx	xx		xx	xx	xx		xx	xx	xx	
Ambient Assisted Working & Living	x	xx	xx	xx	x	xx	xx	xx	x	xx	xx	xx
Building safety and security	x	xx	xx	x	x	xx	xx	x	x	xx	xx	x
Evidence-Based Design 2	x	xx	xx	x	x	xx	xx	x	x	xx	xx	x
Smart Infrastructure & Artificial Intelligence	x	xx	xx	x	x	xx	xx	x	x	xx	xx	x
R&D Project	x	x	xx	x	x	x	xx	x	x	x	xx	x
Semester 4												
Master Thesis incl. Presentation	x	x	xx	x	x	x	xx	x	x	x	xx	x

Legend: xx strong relation; x medium relation