

# Qualification goals

## Master Medical Informatics

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**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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***As of: 20/10/2020***

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## **1 Objectives of the programme**

The Master programme Medical Informatics aims to enable graduates of a Bachelor or Diploma programme in computer science, health sciences or economics to deepen their understanding and knowledge of medical informatics and information security, and offers research opportunities in the field of medical informatics.

This uniquely innovative, interdisciplinary and international programme taught exclusively in English offers excellent and motivated graduates of biomedical and computer science disciplines from around the world an exclusive opportunity to acquire in-depth knowledge, professional skills and competencies in the fields of medical informatics, electronic healthcare services, decision support systems, telemedicine, international health management and ethics, global and public health informatics, translational research informatics and home care.

The aim of the programme goes beyond the basic objective of “employability” toward professional proficiency and career success. The focus is on hands-on, solution-oriented and implementation-oriented competencies in an international context, which are gained through concrete, practice-based projects and real-life case studies. Competencies in the areas of healthcare, eHealth, research and methodology as well as soft skills are developed through a module-based course structure. Within the modules, synthesis and synchronisation is achieved by translating knowledge into concrete case studies (deduction and induction).

## **2 Learning outcomes of the programme**

The main features of this programme are a balanced combination of lectures, seminars and class discussions, case studies, lab training and complementary activities such as participation in conferences and meetings or field visits to healthcare facilities and digital health companies. This programme imparts solid theoretical knowledge, practical skills and methods expertise in the field of digital health - with an emphasis on management and research components - and prepares graduates to take over leadership positions and drive the digital transformation of healthcare in Germany and worldwide.

The areas of competence that students of the Master programme of Medical Informatics learn can be described as follows.

Module group: Healthcare:

Today, healthcare is practised in a digitally networked context. This means that healthcare systems consist of macro, meso and micro levels of legal requirements and regulations of self-government, organisations and regional provision. The knowledge and consideration of management processes, as well as the legal foundations of healthcare at the national and international level, form the basis of these IT processes. The legal challenges that arise require a basic assessment of competence based on compliance.

Module group: eHealth:

eHealth is an umbrella term for a wide range of information and communication technologies (ICT), for example for telemedicine applications where information data on patient treatment and care is digitally processed and exchanged via secure data connections. eHealth and ICT technologies are based on internationally agreed communication standards and classification systems and are, per se, collaborative systems with different interfaces. Current challenges concern data protection and data security. These challenges require a solid assessment of competence based on legal requirements.

Module group: Research & Methodology:

Evidence-based medicine offers empirically verifiable treatments that are offered worldwide and are primarily available as per the guidelines of medical societies. Evidence-based decisions based on health-economic principles are skills that every eHealth application must fulfil. eHealth generates data volumes that can only be processed using modern data mining and data analysis techniques and thus form the basis for medical, therapeutic and nursing services.

Module group: Soft Skills:

Healthcare is provided in an interdisciplinary, multi-professional context in which multilingual services play an important role. Understanding the differences in acceptance and compliance with healthcare services in different countries is important and so is the ability to work in multicultural and mixed teams.

### 3 Study objectives and qualification goals

#### **Knowledge:**

Students will have acquired the following knowledge by the end of the programme:

- “Bridging Knowledge” - basic knowledge in medicine and informatics for students with a technical or biomedical background to prepare them for acquiring knowledge and skills in the interdisciplinary field of digital health;
- In-depth knowledge of international and global health management - approaches and methods for designing and providing various healthcare services, knowledge of global health challenges, as well as practical methods on the structure, functions and financing of national and international healthcare systems;
- In-depth knowledge of medical and health informatics - approaches and methods of information representation and management in medicine and healthcare with an emphasis on health standards, interoperability, data integration and data aggregation, artificial intelligence/machine learning in healthcare;
- In-depth, application-relevant knowledge and expertise in the field of digital health - approaches and methods of digitalisation in healthcare with an emphasis on telematics, telemedicine and eHealth - and in the field of digital healthcare applications, as well as knowledge of national and international healthcare service providers;
- In-depth knowledge of evidence-based medicine and data analysis in healthcare - approaches and methods for designing, implementing and interpreting health research, including modern statistical and analytical methods.

#### **Skills:**

- Carrying out and presenting a comprehensive, critical analysis and assessment of the healthcare system of a particular country, with particular attention to shortcomings and areas of suboptimal performance, identification of possible approaches and solutions for digital health in order to improve results;
- Carrying out and presenting a comprehensive, critical analysis of a specific healthcare issue or problem and identifying possible digital health solutions;
- Implementation of relevant informatics methods and tasks to solve specific medical and health-related issues;
- Designing and implementation of a prototype healthcare information system,

formulation of technical and operational requirements, identification of required resources, definition of architecture and other technical specifications, building or acquisition of the required capacity;

- Working with existing health standards, classifications, terminologies and various sets of codes in the field of medical and health informatics.
- Carrying out and presenting a comprehensive, critical analysis and assessment of a digital healthcare/eHealth system or digital health landscape in a particular country, with particular attention to shortcomings and areas of suboptimal performance, identification of possible approaches and solutions for improving the functioning of the system;
- Execution and presentation of benchmarking reports or market research in the field of digital health/eHealth;
- Analysis and assessment of business relationships and development of business-oriented and entrepreneurial approaches in the field of digital health/eHealth;
- Critical analysis of academic research results and presenting them in the form of academic reports or academic publications, while respecting high protection standards of intellectual property rights;
- Designing, execution, publishing and presentation of a professional academic research project in the field of digital health/eHealth, medical and health informatics, international and global health management.
- Designing and implementation of a prototype of a digital health/eHealth product (application, service, project or programme) for a specific healthcare facility, system or company, definition of needs and requirements;

### **Competencies:**

Graduates acquire the following competencies:

- Application of professional terminology in the fields of digital health/eHealth, telemedicine, medical and health informatics, international and global health management;

Students can implement theoretically acquired knowledge in a practical and solution-oriented manner.

- Supporting, designing and conducting various educational activities (both at the degree and certificate levels) in the areas of digital health/electronic healthcare services, telemedicine, medical and health informatics,

international and global health management;

- Graduates can express themselves fluently orally and in writing and conduct negotiations;
- Application-oriented problem solving using simple and complex methods
- Research, interpretation and application of academic technical texts to everyday situations in institutions or companies;
- Knowing the different stakeholders in the field of digitalisation in healthcare, as well as consideration of goals in the corporate strategy
- Entrepreneurial thinking and action, formulation of business strategies, developing business models and building companies
- Organising a team and demonstrating leadership qualities in interdisciplinary cooperation
- Reflection on actions and adapting to ethical, ecological, social and economic circumstances
- Critical assessment of one's own strengths and weaknesses and their impact on others. Graduates can contribute to conflict resolution and handle criticism constructively.
- Recognising the need for lifelong learning and acquisition of relevant skills.
- Independent formulation of academic tasks for theoretical and experimental research; in addition, particularly qualified students acquire theoretical foundations that enable them to pursue a doctorate or work in academic fields.

## 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 objectives.

<b>Matrix of objectives of the modules in the Master programme of Medical Informatics</b>												
Module	Objectives											
	Knowledge				Skills				Competencies			
	Healthcare	eHealth	Research & Methodology	Soft Skills	Healthcare	eHealth	Research & Methodology	Soft Skills	Healthcare	eHealth	Research & Methodology	Soft Skills
<b>Semester 1</b>												
FWP 1: Medicine for Non-Physicians			xx				xx				xx	
FWP 2: Computer Science for Medics			xx				xx				xx	
International Healthcare	xx				xx				xx			
Medical Informatics		xx				xx				xx		
eHealth and Telemedicine		xx				xx				xx		
Standards, Terminology and Classification		xx				xx				xx		
Evidence-Based Medicine			xx				xx				xx	
<b>Semester 2</b>												
Medical Documentation Systems		xx				xx				xx		
eHealth Application Systems		xx				xx				xx		
Health Economy and Health Research			xx				xx				xx	
Collaborative Systems		xx				xx				xx		
Data Security and Data Protection		xx				xx				xx		
<b>Semester 3</b>												
Soft skills				xx				xx				xx

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