

# Information Sheet

## Course of Study

# Industrial Internet Informatics

### General Information

Industrial 4.0 Informatics involves programming skills based on sound knowledge of engineering sciences and methodological expertise. Students will learn how to develop clear IT structures, how to write programs using modern state-of-the-art software technology and how to integrate software and hardware into robust complete systems. Creativity, analytical skills and communication skills are essential. The programme opens up excellent career options in various areas, for example in the automotive industry, in automation, production control, logistics, communications and internet technology, just to name a few. Graduates who are particularly well-qualified may continue their studies with a Master Programme in *IT and Information*.

The programme takes seven semesters to complete and leads to a **Bachelor of Engineering degree (B. Eng.)**.

Besides the engineering basics, the course contents involve

- Core computer skills
- Special areas of application in the field of Industry 4.0
- Interdisciplinary fundamentals and core competencies
- Practical application

The areas of application in the field of Industry 4.0 include

- Cyber-Physical Systems, Sensor-Actuator Networks
- Embedded Systems and Embedded Intelligence
- Internet of Things, Product Memory
- Big Data, Data Analytics
- Intelligent Human-Machine Interfaces, Operator Support Systems, Factory Apps
- Real-Time Operating Systems
- Cyber Security, Network Security, Penetration Testing
- Innovative Plant Systems, Manufacturing Execution Systems

### Programme Structure

The programme is divided into three phases. The first phase (first and second semester) comprises the following modules:

- Mathematics
- English
- Foundations of Digital Systems

- Cyber-Physical Systems 1
- Programming
- Theoretical Information Technology
- Operating Systems
- Data Base Systems
- Basics of Coding Theory and Cryptology

The second phase (third and fourth semester) is designed to deepen the basic skills and to prepare the students for the practical semester. It involves the following modules:

- Algorithms und Data Structures
- Stochastics
- Computer Networks
- Information Ethics and Philosophy of Technology
- Software Engineering I
- Data Analytics
- Embedded Systems
- User Interface Programming
- Mobile & Ubiquitous Computing
- Control Engineering
- Industrial Communication / Industrial Ethernet
- Project Management and Agile Development Methods

The third phase (fifth, sixth and seventh semester) includes the practical placement during the fifth semester and further specialization in the following modules:

- Cyber-Physical Systems 2
- Industry 4.0-Project
- Software Engineering 2 und Software Project
- Mandatory Electives (e.g. Web Application Development, Artificial Intelligence, Physical Computing, etc.)
- Computer Vision
- Information Security
- Real-Time Operating Systems
- Manufacturing Execution Systems
- Bachelor Seminar und Final Paper

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