

Course No.: DLMBMMIT01	Course Title: Internet of Things	Hours Total: 150 h
		Credit Points: 5 ECTS
Course Type: Wahlpflicht Course Availability: WS, SS Course Duration: Minimum 1 Semester		Admission Requirements: None
Course Coordinator / Instructor: See current list of tutors in the Learning Management System		References to Other Modules: Please see module description

Course Description:

The Internet of Things, once a rough vision, today becomes reality in a broad manner. There is a plethora of devices and services available to both consumer and businesses. From smart homes to smart cities, from smart devices to smart factories – internet of things technologies impact on our live and environment.

This course follows a top-down approach, discussing a broad set of aspects connected with the internet of things. It starts with use cases and risks from customer and business perspectives and ends up with the technical foundation of the internet of things. To address the engineering perspective, a set of techniques is proposed.

Course Objectives and Outcome:

Upon successful completion of the course, students will be able to:

- distinguish and discuss a broad range of use cases for the internet of things (IoT).
- deeply understand and reflect the different perspectives on the internet of things.
- apply distinct techniques to engineer internet of things products.
- evaluate and identify appropriate IoT communication technology and standards according to given IoT product requirements.
- reflect on the resp. theoretical foundation, evaluate different approaches and apply adequate approaches on practical questions and cases.

Teaching Methods:

The learning materials include printed and online course books, vodcasts, online knowledge tests, podcasts, online tutorials, and case studies. This range of learning materials is offered to students so they can study at a time, place, and pace that best suits their circumstances and individual learning style.

Course Content:

- 1. Introduction Into the Internet of Things**
 1. Foundations and Motivation
 2. Evolution of the Internet
- 2. Social and Business Relevance**
 1. Innovations for Consumers and Industry
 2. Impact on Human and Work Environment
 3. Privacy and Security
- 3. Communication Standards and Technologies**
 1. Network Topologies
 2. Network Protocols
 3. Technologies
- 4. Data Storage and Processing**
 1. Linked data and RDF(S)
 2. Semantic Reasoning
 3. Complex Event Processing
 4. NoSQL and MapReduce
- 5. Design and Implementation**
 1. Software Engineering for Distributed and Embedded Systems
 2. Architectural Styles and Patterns
 3. Platforms
- 6. Fields of Application**
 1. Smart Home/Living
 2. Ambient Assisted Living
 3. Smart Energy/Grid
 4. Smart Factory
 5. Smart Logistics

Literature:

- Chaouchi, H. (2013). The Internet of Things: Connecting Objects. London: Wiley.
- Greengard, S. (2015). The Internet of Things. Cambridge, Massachusetts: MIT Press.
- Kellmereit, D. & Obodovski, D. (2013). The Silent Intelligence: The Internet of Things. San Francisco: DND Ventures.
- Slama, D., Puhlmann, F., Morrish, J., & Bhatnagar, R. M. (2016). Enterprise IoT: Strategies and Best Practices for Connected Products and Services. Beijing, Boston, Farnham, Sebastopol, Tokyo: O'Reilly.
- Weber, R. H., & Weber, R. (2010). Internet of Things: Legal Perspectives. Berlin, Heidelberg: Springer-Verlag. <http://site.ebrary.com/lib/alltitles/docDetail.action?docID=10395432>.

An actual list with course-specific mandatory reading as well as references to further literature is available in the Learning Management System.

Prerequisites to Qualify for Assessment:

- Depending on the course: Completion of online knowledge tests (approx. 15 minutes per unit, pass / not pass)
- Course evaluation

Assessment:

- Exam, 90 min.

Student Workload (in hours): 150

Self-study: 90 h

Self-examination: 30 h

Tutorials: 30 h