

Course Manual IOT

IoT Protocols and Applications

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– General information

Long name IoT Protocols and Applications

Approving CModule [IOT_BaET](#), [IOT_BaTIN](#)

Responsible Prof. Dr. Harald Elders-Boll
Professor Fakultät IME

Valid from summer semester 2022

Level Bachelor

Semester in the year summer semester

Duration Semester

Hours in self-study 114

ECTS 5

Professors Prof. Dr. Harald Elders-Boll
Professor Fakultät IME

Requirements Fundamentals of Computer Networks
Network application and Protocols
Transport Layer
Fundamentals Link Layer
Fundamentals Fundamentals of Network Security

Language German and English

Separate final exam Yes

Literature

P. Lea, "Internet of Things for Architects", Pakt, 2018

A. Bahga, V. Madisetti, "Internet of Things A Hands-on Approach", Bahga & Madisetti

B. Adyan, D. Obermaier, P. Fremantle, "The Technical Foundations of IoT", Artech House, 2017

Final exam

Details

Form: oral examination, duration: 30 minutes, optional, in case of a large number of students: written exam, duration 90 minutes
The topics and problems from different parts of the course are answered or discussed by the students, respectively. Short calculations are performed or sketched. Different taxonomies are rated according to their complexity and difficulty.

Minimum standard

Basic knowledge can be adequately applied to known and related problems. The execution is in parts faulty. (4,0)

Exam Type

EN Klausur

– Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	<p>The underlying concept of this module is a combination of lecture and tutorial. After a lecture block the subjects taught are actively trained by solving corresponding problems.</p> <p>Syllabus: Introduction to IoT Applications of IoT Hard- and Software Fundamentals for IoT IoT System and Architectures IoT Communications Protocols IoT Application Protocols (MQTT, CoAP, HTTP, REST) Data Analytics and Machine Learning for IoT IoT Security</p>
Skills	<p>Distinguish different IoT architectures. Analyse IoT system using suitable tools. Connect Iot end devices to IoT systems. Assess the security of IoT systems.</p>

Special requirements

none

Accompanying material	Soft copies of lecture slides and tutorial materials.
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Separate exam	No
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Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	1
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

– Practical training

Learning goals

Goal type	Description
Skills	Connect sensors and actuators to microprocessors and single-board computers Connect IoT devices to the cloud Transmit measurement data to the cloud Compromise hand- and software of IoT devices Sniffing the communication of IoT devices

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	0
Tutorial (voluntary)	0

Special requirements

none

Accompanying material Lab instructions

Separate exam Yes

Separate exam

Exam Type EN praxisnahes Szenario bearbeiten (z.B. im Praktikum)

Details Successful solution of the lab problems in small groups consisting of two students, in general.

Minimum standard Successful participation of all labs. Per lab the substantial parts have to be accomplished individually from each group.