HAW Kiel
Hochschule für Angewandte Wissenschaften Kiel
Kiel University of Applied Sciences

BK121 - Embedded Systems / Internet of Things (IoT) AG (Engl)

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General information	
Module Code	BK121
Unique Identifier	EmbedSysInte-01-BA-M
Module Leader(s)	Prof. Dr. Patz, Ralf (ralf.patz@haw-kiel.de)
Lecturer(s)	Prof. Dr. Acker, Wolfram (wolfram.acker@haw-kiel.de) Prof. Dr. Patz, Ralf (ralf.patz@haw-kiel.de)
Offered in Semester	Sommersemester 2025
Module duration	1 Semester
Occurrence frequency	Regular
Module occurrence	In der Regel jedes Semester
Language	Englisch
Recommended for international students	Yes
Can be attended with different study programme	Yes

Curricular relevance (according to examination regulations)
Study Subject: B.Eng. - E - Elektrotechnik (PO 2017, V3) Module type: Wahlmodul Semester: 6
Study Subject: B.Eng. - E - Elektrotechnik (PO 2023, V4) Module type: Wahlmodul Semester: 6
Study Subject: B.Eng. - Me (PO 2023) - Mechatronik (PO 2023, V4) Module type: Wahlmodul Semester: 4, 6
Study Subject: B.Eng. - Me (PO 2024) - Mechatronik (PO 2024, V5) Module type: Wahlmodul Semester: 4, 6
Study Subject: B.Eng. - Ming - Medieningenieur/-in (PO 2018, V1 + PO 2021, V2) Module type: Wahlmodul Semester: 4, 6
Study Subject: B.Eng. - Wing - Wirtschaftsingenieurwesen - Elektrotechnik (PO 2017, V1) Module type: Wahlmodul Semester: 6
Study Subject: B.Eng. - Wing - Wirtschaftsingenieurwesen - Elektrotechnik (PO 2023, V2) Module type: Wahlmodul Semester: 6
Study Subject: B.Sc. - INF - Informatik (PO 2021,V1) Module type: Wahlmodul Semester: 4, 6
Study Subject: B.Sc. - INI - Informationstechnologie (PO 2017, V1) Module type: Wahlmodul Semester: 4
Study Subject: B.Sc. - WINF - Wirtschaftsinformatik (6 Sem.) Module type: Wahlmodul Semester: 4

Study Subject: B.Sc. - WINF 7 Sem. - Wirtschaftsinformatik (7 Sem.)
Module type: Wahlmodul
Semester: 6

Qualification outcome

Areas of Competence: Knowledge and Understanding; Use, application and generation of knowledge; Communication and cooperation; Scientific self-understanding / professionalism.

The students
- will understand the principles of embedded systems based on micrcontrollers and single-board computer.
- will be able the evaluate products and systems based on embedded systmes.
- will work in teams on tasks and will be able to defend and argue their positions against the other team members.

Content information

Content	Embedded systems are used in most electronic systems nowadays. The term "Internet of Things" (IoT) as been coined as they get increasingly networked (Ethernet, Wifi, Bluetooth, etc.) via the Internet. This module exposes the students to embedded systems as well as to the IoT. The concepts and tools are conveyed via project work using different embeded system platforms (e.g. Ardunio, Raspberry PI, ARM Mikrocontroller, or similar). Different approaches are used in order to take into account the different levels of students.
Literature	• Charalampos Doukas, Building Internet of Things with the Arduino, CreateSpace Independent Publishing Platform, 2012. • Charles Bell, Beginning Sensor Networks with Arduino and Raspberry Pi, Apress; Auflage: 2013 • E.F. Engelhardt, Sensoren am Raspberry Pi, Franzis Verlag GmbH, 2014. • Texas Instruments Launchpad, www.ti.com/launchpad

Teaching formats of the courses

Teaching format	**SWS**
Labor	4

Workload

Number of SWS	4 SWS
Credits	5,00 Credits
Contact hours	48 Hours
Self study	102 Hours

Module Examination

Examination prerequisites according to exam regulations	None
BK121 - Projektbezogene Arbeiten	Method of Examination: Projektbezogene Arbeiten Weighting: 100% wird angerechnet gem. § 11 Absatz 2 PVO: No Graded: Yes

Miscellaneous	
Miscellaneous	The module is project orientated and offered every semester. This allows the student to work on the project for a longer time period. It is therefore possible, and encouraged, to enrol into the module for more than one semester. In this case the module is limited to a total of 5 CP. The attendance of the laboratory sessions is compulsory.