Technology
Arts Sciences
TH Köln

Course
GVI - Principles of Networked IT Systems

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^ General information

Long name	Principles of Networked IT Systems
Approving CModule	GVI_BaET
Responsible	Prof. Dr. Harald Elders-Boll Professor Fakultät IME
Level	Bachelor
Semester in the year	winter semester
Duration	Semester
Hours in self-study	96
ECTS	5
Professors	Prof. Dr. Harald Elders-Boll Professor Fakultät IME Prof. Dr. Uwe Dettmar Professor Fakultät IME Prof. Dr. Rainer Kronberger Professor Fakultät IME
Requirements	Elemental functions, complex calculus, integral and differential calculus Current, Voltage, Work, Energy, Power, Electric field, Magnetic Field
Language	German
Separate final exam	Yes

Final exam

Details

Form: written exam (optional: oral examination):

During the exam students shall demonstrate by solving problems dealing with the fundamentals of wired and wireless communication systems,
networked IT and IoT components, that they are able to apply the fundamental terms, concepts and techniques to create connected IT systems.

Duration: 90 minutes

DFifferent taxonomies are rated according to their complexity and difficulty

Minimum standard

Grundwissen kann auf bekannte bzw. verwandte Probleme angewendet werden, Umsetzung teilweise fehlerhaft. (4,0)

Exam Type

Form: written exam (optional: oral examination):

During the exam students shall demonstrate by solving problems dealing with the fundamentals of wired and wireless communication systems, networked IT and IoT components, that they are able to apply the fundamental terms, concepts and techniques to create connected IT systems.

Duration: 90 minutes

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^ <u>Lecture / Exercises</u>

Learning goals

Knowledge

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.

Syllabus:
Fundamentals of Computer Networks
Network application and Protocols
Transport Layer Fundamentals
Link Layer Fundamentals
Fundamentals of Network Security
Fundamentals of Communication Systems
Fundamentals of Digital Modulation
Frormatting and Coding Fundamentals
Fundamentals of Anennas and Transmission Lines
Transmitter, Receiver, Matching
Amplifiers and Noise

Students shall deepen their knowledge by self-study of literature and internet ressources and discuss their results in small learning groups as teamwork.

By working with small exercises during the presence time students are able to actively train their knowledge. More extensive problems are solved and dis

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	1

Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

Separate exam

^ <u>Practical training</u>

Learning goals

Skills

Practical self-study labs with the following subjects:
Installation of the operating system on the Raspberry Pi
Raspberry Pi initial setup and netwotk configuration
Analysis of network connectivity
Analysis of name resolution
Setup the Raspberry Pi as an ad-blocker
Setup the Raspberry Pi as a Wifi router

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	0

Separate exam

Exam Type

working on practical scenarion (e.g. in a lab)

Details

Students will solve small practical self-study problems in small grous of normally two studentseither at home or in the lab.
To check the acquired skills at the corresponding lab appointment, students will have to show a working configuration, make changes, etc.
In case of failure, a follow-up appointment must be taken; in case of multiple failures, the student will be excluded from the lab.

Minimum standard

Successful participation in all laboratory appointments, i.e. in particular independent solution of the self-study problems.