

## Course

# GVI - Principles of Networked IT Systems

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Version: 2 | Last Change: 13.09.2019 21:18 | Draft: 0 | Status: vom verantwortlichen Dozent freigegeben

### ^ General information

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

Different 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

Different taxonomies are rated according to their complexity and difficulty

## ^ Lecture / Exercises

### Learning goals

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#### 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

Formatting and Coding Fundamentals

Fundamentals of Antennas and Transmission Lines

Transmitter, Receiver, Matching

Amplifiers and Noise

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

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

### Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	1

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

## Separate exam

none

## ^ Practical training

### Learning goals

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#### Skills

Practical self-study labs with the following subjects:

Installation of the operating system on the Raspberry Pi

Raspberry Pi initial setup and network 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.