

# Course Manual 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

**Valid from** winter semester  
2021/22

**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

## Literature

J. Kurose, K. Ross: "Computernetzwerke - Der Top-Down-Ansatz", Pearson-Studium.

A. Tanenbaum: „Computernetzwerke“, Prentice Hall.

M. Meyer. "Kommunikationstechnik", Vieweg und Teubner.

## 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)

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**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: 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</p> <p>Students shall deepen their knowledge by self-study of literature and internet resources and discuss their results in small learning groups as teamwork.</p>
Knowledge	<p>By working with small exercises during the presence time students are able to actively train their knowledge. More extensive problems are solved and dis</p>

### Special requirements

none

### Accompanying material

lecture slides, problems and solutions, course page in the Ilias learning platform.

### Separate exam

No

### 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	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

### Special requirements

none

<b>Accompanying material</b>	Lab instructions optional: Raspberry Pi mit enclosure, power supply and ethernet cable as a loan
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<b>Separate exam</b>	Yes
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### Separate exam

<b>Exam Type</b>	EN praxisnahes Szenario bearbeiten (z.B. im Praktikum)
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<b>Details</b>	Students will solve small practical self-study problems in small groups of normally two students either 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.
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<b>Minimum standard</b>	Successful participation in all laboratory appointments, i.e. in particular independent solution of the self-study problems.
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