# Communication Networks I

<table>
<thead>
<tr>
<th>Responsible Lecturer</th>
<th>Prof. Dr. Stefan Böhmer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecturers</td>
<td>Prof. Dr. Stefan Böhmer</td>
</tr>
<tr>
<td>Assignment</td>
<td>Bachelor Computer Science, 4th Semester, BI-SPZ-TK (6 CP)</td>
</tr>
<tr>
<td>Modules</td>
<td>BI-4-SPZ-1/2, BI-4-WPF-1, BI-5-SPZ-1/2, BI-5-WPF-1</td>
</tr>
<tr>
<td>Semester Hours</td>
<td>Lectures: 2 / exercises: 2</td>
</tr>
<tr>
<td>Work Load</td>
<td>On-Campus: 60 hours / Off-Campus: 120 hours</td>
</tr>
<tr>
<td>Language</td>
<td>Lecture: English; Exercise German, English support upon request</td>
</tr>
<tr>
<td>Expected prior knowledge</td>
<td>Lecture Networks (2nd Semester)</td>
</tr>
</tbody>
</table>

## Learning Targets

The students have a basic insight into communication networks, related tasks and problems as well as the relevant techniques, methods and procedures used there. At the same time, they have a comprehensive basic competence for independent and scientific work. Through the exercises and the practical training, they learn how to handle complex telecommunication systems and related IT systems safely.

As media supporting the lecture, the slides are available to the students in advance in electronic form, which can be supplemented by own notes during the lecture. The postprocessing of the lecture by the students should be done by means of primary or secondary literature. The content of the lecture is designed to allow for a strong interaction between lecturer and students, so that sufficient time is available for answering questions and solving problems.

The exercise or practical training offers students the opportunity to try out the techniques mentioned on selected examples or to work independently on more demanding tasks on the respective topic. They serve to repeat, deepen and apply the material. A regular part of the exercises are application-oriented problems that can be solved with the concepts and methods learned in the lecture and visualize them.

## Content

- Design and structure of telecommunications networks
  - Development and structure of private and public networks
  - Network planning
  - Network dimensioning
  - Deregulation in Germany, Technical implications of the Telecommunications Act (TKG)

### Addressing in public and private networks

- Addressing in public networks according to ITU-T E.164
- Extended addressing procedures on the Internet
- Variable Lenth Subnet Mask (VLSM)
- Classless Interdomain Routing (CIDR)
- Network Address Translation (NAT)
- Network Address And Port Translation (NAPT)
## Course Content

**Routing and protocols**
- Routing methods and algorithms
- Routing Information Protocol Version 2 (IGP/Distance Vector)
- Open Shortest Path First Protocol (OSPFv2)

**Internet of Things (Part 1)**
- Introduction to IoT (concepts and approaches)
- Standardization

## Course Work

<table>
<thead>
<tr>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-hour exam</td>
</tr>
</tbody>
</table>

## Media

- Lecture slides
- Exercise documents
- Practical training descriptions
- Blackboard notes in lecture and exercise
- Internet resources

## Literature

**Primary literature:**
- Request For Comments (RFC) of the IETF (www.ietf.org) and standards of the International Telecommunication Union (www.itu.org)

**Secondary literature:**
- A. Badach, E. Hoffmann, Technik der IP-Netze, Hanser Verlag, Munich, 2015

## URL

[http://comnets.brsu.de/](http://comnets.brsu.de/)