

## Communication Networks II

Responsible Lecturer	Prof. Dr. Stefan Böhmer
Lecturers	Prof. Dr. Stefan Böhmer
Assignment	Bachelor Computer Science, 5th Semester, BI-SPZ-TK (6 CP)
Modules	BI-4-SPZ-1/2, BI-4-WPF-1, BI-5-SPZ-1/2, BI-5-WPF-1
Semester Hours	lectures: 2 / exercises: 2
Work Load	On-Campus: 60 hours / Off-Campus: 120 hours
Language	Lecture: English; Exercise German, English support upon request
Expected prior knowledge	
Learning Targets	<p>The lecture introduces essential topics concerning the design, structure and technologies of communication networks. The aim is to learn basic skills for dimensioning and conceptual design of communication networks and systems based on concrete problems/tasks from practice.</p> <p>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.</p> <p>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.</p>
Content	<p>Internet of Things (Part II)</p> <ul style="list-style-type: none"> <li>• Concepts</li> <li>• Components</li> <li>• Radio systems and landlines</li> <li>• Protocols</li> </ul> <p>Traffic management in public (voice) networks</p> <ul style="list-style-type: none"> <li>• Switching systems</li> <li>• Signalling systems and signalling (SS7)</li> <li>• Routing / traffic control in public networks</li> <li>• Dimensioning and planning of public voice networks (terms of traffic theory)</li> <li>• MPLS</li> </ul> <p>Next generation networks</p> <ul style="list-style-type: none"> <li>• Voice over IP infrastructures</li> </ul>

	<ul style="list-style-type: none"> <li>• Session Initiation Protocol (SIP)</li> <li>• Directory services (ENUM)</li> <li>• RTP/SRTP and SIPS</li> </ul> <p>Interconnection</p> <p>Access networks</p> <ul style="list-style-type: none"> <li>• bundled/unbundled subscriber access</li> <li>• DSL technologies (VDSL and ADSL)</li> <li>• Infrastructure and network elements</li> <li>• Capacity planning</li> </ul>
Course Work	<p>Examination</p> <ul style="list-style-type: none"> <li>• Two-hour exam</li> </ul>
Media	<ul style="list-style-type: none"> <li>• Lecture slides</li> <li>• Exercise documents</li> <li>• Practical training descriptions</li> <li>• Blackboard notes in lecture and exercise</li> <li>• Internet resources</li> </ul>
Literature	<p>Primary literature:</p> <ul style="list-style-type: none"> <li>• Request For Comments (RFC) of the IETF (<a href="http://www.ietf.org">www.ietf.org</a>) and standards of the International Telecommunication Union (<a href="http://www.itu.org">www.itu.org</a>)</li> </ul> <p>Secondary literature:</p> <ul style="list-style-type: none"> <li>• U.Trick/F.Weber, SIP und Telekommunikationsnetze, 5th edition, Oldenbourg Verlag, Munich, 2015</li> <li>• Carrier Grade Voice over IP, McGraw-Hill Education; 3rd edition, 2013</li> <li>• H. Hanrahan, Network Convergence, Wiley &amp; Sons, Chicester (UK), 2007</li> <li>• A. Badach, E. Hoffmann, Technik der IP-Netze, Hanser Verlag, Munich, 2015</li> </ul>
LEA Course	<p><a href="https://lea.hochschule-bonn-rhein-sieg.de/goto.php?target=crs_627916&amp;client_id=db_040811">https://lea.hochschule-bonn-rhein-sieg.de/goto.php?target=crs_627916&amp;client_id=db_040811</a></p>