Microcontroller Technology / Communications Engineering (Lab)

<table>
<tr><td colspan="7">Microcontroller Technology / Communications Engineering (Laboratory Internship)</td></tr>
<tr><td colspan="2">Code
SN III</td><td>Workload
180 h</td><td>Credits
6 C</td><td>Semester
6. Semester</td><td>Semester Offered
Every Summer Semester</td><td>Duration
1 Semester</td></tr>
<tr><td>1</td><td colspan="3">Type of Course
Internship: 1,5 SWS</td><td>Scheduled Learning
22,5 h</td><td>Independent Study
157,5 h</td><td>Approx. Number of Participants
Internship: 15</td></tr>
<tr><td>2</td><td colspan="6">Learning Outcomes / Competences

The students

• can use a microcontroller system practically, program independently and analyze the program code for errors
• can connect and control peripheral elements
• can design and use a transmission protocol according to an application
• can implement communication algorithms under real-time requirements in a real microcontroller environment and bring them into operation
• can independently design and dimension simple electronic circuits, perform measurements on them and evaluate them
• can work and communicate efficiently in a group, divide work and document the procedure and progress
• can make technical presentations and communicate facts in an understandable way</td></tr>
<tr><td>3</td><td colspan="6">Contents

Implementation of communication systems and networks by microcontroller-based systems within the scope of a practical course, e.g.

• Construction of a communication line
• Measurement of characteristic parameters
• Interference of sensor networks in industrial environment (EMC)
• Characterization and optimization of the transmission
• Measurement and analysis of real-time signals</td></tr>
<tr><td>4</td><td colspan="6">Teaching Methods

Practical work in Lab</td></tr>
<tr><td>5</td><td colspan="6">Content-Related Module Prerequisites

Formal: none</td></tr>
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	In Terms of Content: Principles of electrical engineering, basics of circuit technology, basics of microcontroller programming, communications engineering
6	**Type of Exams** Design (100%) Exam language: German / Englisch
7	**Prerequisite for the Granting of Credits** Passed module exam
8	**This Module Appears in**
9	**Weighting of Grade in Relationship to Final Grade** Weighting equals the proportion of module credits in relationship to the total number of grade-relevant credits
10	**Module Leader / Teaching Staff** Prof. Dr. Lothar Kempen, Prof. Dr. Klaus Thelen
11	**Additional Information / Literature** Literature will be announced each semester