Learning Outcomes

This module’s qualification aims are:
1. In depth understanding of sensors and sensor interfaces and their combination in order to enable smart sensors.
2. Proper handling of circuit design software like LTSpice or Cadence. In addition Matlab or Scilab for model investigation or characterization.
3. Profound knowledge of key parameters and design challenges of smart sensors and sensor interfaces.
4. Ability to analyze a metrological problems, to identify suitable methods to design optimized sensors and related interfaces including characterization and critical discussion.
5. In depth understanding of sensor processing issues.

Content

Project topics will be identified during a first meeting with the supervisor. Students are encouraged to contribute their own ideas. Possible topics include sensor and sensor interface design as well as methods and techniques to process (fabricate) them. To realize a project in that area, software like LTSpice, Cadence, Scilab, or Matlab are used. Furthermore a well equipped laboratory enables experiments and realization of hardware. In case of technology related topics, students have access to clean rooms. Students will work individually or in groups.

Module Components

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Type</th>
<th>Number</th>
<th>Cycle</th>
<th>SWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart sensors and sensor interfaces</td>
<td>PJ</td>
<td>WS/SS</td>
<td>4</td>
<td></td>
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</tbody>
</table>

Workload and Credit Points

<table>
<thead>
<tr>
<th>Smart sensors and sensor interfaces (Projekt)</th>
<th>Multiplier</th>
<th>Hours</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4a. Preparation of written report</td>
<td>1.0</td>
<td>20.0h</td>
<td>20.0h</td>
</tr>
<tr>
<td>1. Background research</td>
<td>1.0</td>
<td>20.0h</td>
<td>20.0h</td>
</tr>
<tr>
<td>2. Project Work</td>
<td>1.0</td>
<td>110.0h</td>
<td>110.0h</td>
</tr>
<tr>
<td>3. Meeting with supervisor</td>
<td>1.0</td>
<td>10.0h</td>
<td>10.0h</td>
</tr>
<tr>
<td>4b. Preparation of presentation</td>
<td>1.0</td>
<td>20.0h</td>
<td>20.0h</td>
</tr>
</tbody>
</table>

The Workload of the module sums up to 180.0 Hours. Therefore the module contains 6 Credits.

Description of Teaching and Learning Methods

The module consists of a project. Course language is English, incl. all written works (reports, presentations, etc.).

Requirements for participation and examination

Desirable prerequisites for participation in the courses:

In order to be equipped with sufficient knowledge on sensors and sensor interfaces, the participation of “Measurement of Non-electrical Quantities II” is recommend.

Mandatory requirements for the module test application:

No information

Module completion

Grading: graded
Type of exam: Portfolio examination
Language: English
Grading scale:
Note: 1.0 1.3 1.7 2.0 2.3 2.7 3.0 3.3 3.7 4.0
Punkte: 95.0 90.0 85.0 80.0 75.0 70.0 65.0 60.0 55.0 50.0

Test description:
Written report: The written report has to satisfy the following requirements. The report should match the scientific standard of documentation. Furthermore it must contain an objective, methodology and a critical discussion of results.
Presentation: The presentation is composed of 20 minutes talk and a following discussion of about 10 minutes. The presentation will be evaluated regarding content, form and style.

<table>
<thead>
<tr>
<th>Test elements</th>
<th>Category</th>
<th>Points</th>
<th>Duration/Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>(deliverable assessment) Written report</td>
<td>written</td>
<td>75</td>
<td>30-35 pages</td>
</tr>
<tr>
<td>(deliverable assessment) Presentation</td>
<td>oral</td>
<td>25</td>
<td>30 minutes</td>
</tr>
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</table>

Duration of the Module
This module can be completed in one semester.

Maximum Number of Participants
This module is not limited to a number of students.

Registration Procedures
Registration for the module is handled through QISPOS. Further information will be provided individually at the secretary's office.

Recommended reading, Lecture notes
Lecture notes: unavailable
Electronical lecture notes: unavailable

Assigned Degree Programs
This module version is used in the following module lists:

**Computer Engineering (Master of Science)**
StuPO 2015

**Elektrotechnik (Master of Science)**
StuPO 2015

Miscellaneous
No information