inf510 - Energy Information Systems

<table>
<thead>
<tr>
<th>Module label</th>
<th>Energy Information Systems</th>
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<tbody>
<tr>
<td>Module code</td>
<td>inf510</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
<td>Used in course of study</td>
<td>Master's Programme Business Informatics &gt; Bereichswahlmodule</td>
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<td>Master's Programme Computing Science &gt; Angewandte Informatik</td>
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<td>Master's Programme Engineering Physics &gt; Schwerpunkt: Renewable Energies</td>
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<td>Master's Programme Environmental Modelling &gt; Mastermodule</td>
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Contact person

- Module responsibility
  - Sebastian Lehnhoff
  - Die im Modul Lehrenden

Authorized examiners

- Sebastian Lehnhoff
- Die im Modul Lehrenden

Entry requirements

Skills to be acquired in this module

The students will learn different approaches to integrate distributed facilities, the regulatory framework, relevant standards and architecture concepts of energy management systems and will be able to apply this knowledge.

**Professional competence**

The students:

- develop and evaluate IT-architectures for energy management systems
- model objects of this domain appropriately
- model energy information systems
- realise and differentiate advanced tasks of decentralised energy management systems

**Methodological competence**

The students:

- identify problems of energy management, analyse these problems systematically and provide solutions
- apply different simulation approaches of decentralised plants and consumers

**Social competence**

The students:

- discuss solutions for energy management systems in the group
- develop use cases in teams
- present self-developed solutions

**Self-competence**

The students:

- reflect their actions with regard to structuring and decomposing systems
- reflect their own use of power as a limited resource

**Module contents**

This module provides the computer science basics for energy management. It provides the requirements of energy supply information systems with the focus on technical components and the requirements of decentralised and renewable energy plants.

These are:

- Architectures for energy information systems, e.g. SOA, Seamless Integration Architecture (IEC TC 57), OPC-UA
- Norms and standards of energy industry data models (CIM, 61850)
- Systematisation of energy information system requirements based on ontologies
• Development, analysis and adaption of energy industry reference models and processes
• Methods and technologies to support energy industry processes
• Methods and algorithms to support decision processes of the decentralised energy plants control
• Smart Grid plant communication, particularly for load management
• Methods for modelling and simulation of power supply system dynamics

Reader’s advisory

• Crastan V.: "Elektrische Energieversorgung II", Springer 2004
• Konstantin, P.: "Praxisbuch Energiewirtschaft", Springer 2006
• Schwab, A.: "Elektroenergiesysteme, Springer 2009

Links
Language of instruction German
Duration (semesters) 1 Semester
Module frequency jährlich
Module capacity unlimited
Modullevel AS (Akzentsetzung / Accentuation)
Modulart je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program
Vorkenntnisse / Previous knowledge

<table>
<thead>
<tr>
<th>Examination</th>
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<th>Student research project or presentation</th>
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<td>At the end of the semester</td>
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Total time of attendance for the module
56 h