Sustainable Energy Systems, MB 601, MB 602

**Keywords:**

**Target Group(s):**
6. Semester

**Workload:**
8 ECTS-Credits (240 hours)

<table>
<thead>
<tr>
<th>Workload</th>
<th>Time (hours)</th>
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<tbody>
<tr>
<td>Contact hours</td>
<td>120</td>
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<tr>
<td>Self study</td>
<td>80</td>
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<tr>
<td>Exam preparation</td>
<td>40</td>
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thereof

**Language of instruction:**
english

**Module owner:**
Prof. Dr.-Ing. Rainer Stauch

**Date:**
29.10.2018

**Prerequisites:**
Thermodynamics 1

**Total Target:**
Achieving a fundamental knowledge about: renewable energies, sustainability and the use of hydrogen as an energy carrier. Achieving the knowledge to design and calculate sustainable, effective and decentralized systems converting and storing energy.

**Module Content:**
Renewable energy sources like solar, wind, hydropower, geothermal, bio-fuels and biomass; energy storage; generation and use of hydrogen; sustainability, efficient power cycles, concept of exergy, environmental impacts, Life Cycle Assessments.

**Reference material:**
lecture notes
D.J.C. MacKay. Sustainable Energy – without the hot air. UIT, 2009

**Offered:**
every semester

**Relevance for other study programs:**
Energy engineering, environmental engineering, supply engineering

**Content and type of Assessment:**
Renewable Energy Sources and Carriers:

Form of learning: lectures, practices and exam preparation
Semester periods per week: 4 hours
Workload: 120 hours

Targets: Achieving a fundamental knowledge about: renewable energies and energy carriers (e.g. the use of hydrogen as an energy carrier).
Sustainable, Efficient and Decentralized Energy Systems:
Form of learning: lectures, practices and exam preparation
Semester periods per week: 2 hours
Workload: 60 hours
Targets: Achieving the knowledge to design and calculate sustainable, effective and decentralized systems converting and storing energy. Implementing Life Cycle Assessments

Laboratory Sustainable Energy Systems:
Form of learning: practices in laboratory
Semester periods per week: 2 hours
Workload: 60 hours
Targets: Deepening and using the knowledge obtained in the lectures.

Assessment:
Renewable Energy Sources and Carriers: Written examination (120 minutes), Sustainable, Efficient and Decentralized Energy Systems: Written examination (60 minutes), Laboratory Sustainable Energy Systems: Certificate