Learning targets are aimed on:

- The most common renewable energy technologies: wind energy, solar & hydro power, and biomass (technical design, market, and economic situation)

- The integration of (fluctuating) renewables into power systems: grid connection aspects & power system balancing

Participants will…

- be able to understand the design of different renewable generation technologies.
- gain knowledge about economic & regulatory aspects of renewable generation.
- be able to evaluate various solutions for the design of renewable production systems.
- gain competence to understand grid integration aspects of renewable generation.
- be able to apply knowledge in certain case studies.
# 3-day Seminar: Compact Scheduling

<table>
<thead>
<tr>
<th>Time</th>
<th>First Day</th>
<th>Second Day</th>
<th>Third Day</th>
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<tr>
<td>8:00</td>
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<td>8:00 – 9:30</td>
<td><strong>Lecture</strong>&lt;br&gt;Wind Energy</td>
<td><strong>Lecture</strong>&lt;br&gt;Solar, Hydro, Geothermal &amp; Biomass</td>
<td><strong>Lecture</strong>&lt;br&gt;Grid Integration</td>
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<td>9:45 – 11:15</td>
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<td>11:30 – 13:00</td>
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<td>Lunch Break</td>
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<td>14:00 – 15:30</td>
<td><strong>Lecture &amp; Case Study</strong>&lt;br&gt;Wind Energy</td>
<td><strong>Lecture &amp; Case Study</strong>&lt;br&gt;Solar, Hydro, Geothermal &amp; Biomass</td>
<td><strong>Lecture</strong>&lt;br&gt;Grid Integration</td>
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<td>15:45 – 17:15</td>
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<td><strong>Field Trip</strong></td>
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<td>17:15</td>
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<td><strong>Exam</strong> (optional)</td>
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Course Agenda

Day 1: Wind Energy
Historical development of wind power & current status; design of wind turbines; special applications: offshore wind & hybrid systems; Homer and/or RETScreen (Case Study)

Day 2: Solar, Hydro, Geothermal, and Biomass
Solar Power; Hydropower; Geothermal; Biomass – Lecture; Solar PV System Design (Case Study)

Day 3: Grid Integration
Basics on grid integration of renewable generation; distribution/ transmission issues; Power system stability; Energy systems; Field Trip to the “Energieberg”
Special: Field Trip

Demonstration of Practical Implementations

- Excursion to the so-called “Energieberg” (Energy Mountain) in Karlsruhe:

- A former dumpsite where know renewable energy is produced by wind power plants, a photovoltaic system, and a thermal power station
Course Instructor Expertise

Dr. Dipl.-Ing. Thomas Ackermann:
- Founder and CEO of Energynautics GmbH
- Extensive global experience in industry
- Research Focus: Renewable Energy
- Lecturer e.g. for Renewable Energies & Wind Energy at the Technical University Darmstadt, the Royal Institute of Technology in Sweden

Dr. Eckehard Tröster:
- Senior Engineer and Consultant at Energynautics GmbH
- Lecturer at the International Department of the Karlsruhe Institute of Technology (KIT)
Questions? Get in touch with us.

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Program Consultants

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tjark.hecht@kit.edu