**Name of module:** Design and development 1  
**Keywords:** Design, development, manufacturing, ecologic, economic,  
**Module number:** Not compulsory  
**Target groups:** 3–7 Semester, exchange students  
**ECTS-Credits:** 4  
**Language of instruction:** English  
**Module owner:** Prof. Dr.-Ing. Alexander Friedrich  
**Date of last change:** 25.08.2013

### Extent of work (hours)

<table>
<thead>
<tr>
<th>Workload</th>
<th>Contact hours</th>
<th>Self study</th>
<th>Exam preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>60</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

### Prerequisites:
Basics in Mechanical Engineering and in Design Engineering

### Total target:
- to demonstrate the value of applying a methodological structured design and development process for state of the art products,
- to build up skills and understanding of ecologic and economic product design

### Module content:
- Design and development methodology:  
  - Design Constraints;  
  - General methods for finding and evaluating solutions/alternatives;  
  - Setting requirements;  
  - The design process (design- and manufacturing phases, V-Cycle, gate reviews, ...);  
  - Change and configuration management  
- Case studies  
- Ecologic and economic design:  
  - Eco-Design methods (including the 10 Golden Rules).  
  - The relationship between Eco-Design and Design for Sustainability;  
  - The principles of design for manufacture and assembly;  
  - The conflict between eco-design, design for manufacture and design for assembly;  
- Practical examples.

### Reference material:
Lecture notes

### Offered:
Every semester

### Relevance for other study programs:
Automotive Engineering

### Submodules and assessments

<table>
<thead>
<tr>
<th>Title of submodule:</th>
<th>Design and Development Methodology (DDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of instruction / form of learning:</td>
<td>Lectures, practices and exam preparation</td>
</tr>
<tr>
<td>Hours per week:</td>
<td>2</td>
</tr>
<tr>
<td>Aims, learning outcomes:</td>
<td>To demonstrate the value of applying a methodological structured design and development process for state of the art products,</td>
</tr>
<tr>
<td>Estimated student workload:</td>
<td>60 h</td>
</tr>
<tr>
<td><strong>Title of submodule:</strong></td>
<td>Ecologic and Economic Design (ECO)</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td><strong>Type of instruction / form of learning:</strong></td>
<td>Lectures, practices and exam preparation</td>
</tr>
<tr>
<td><strong>Hours per week:</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Aims, learning outcomes:</strong></td>
<td>To build up skills and understanding of ecologic and economic product design</td>
</tr>
<tr>
<td><strong>Estimated student workload:</strong></td>
<td>60 h</td>
</tr>
</tbody>
</table>

**Type of assessment:** Written exam (2 x 45 min)