<table>
<thead>
<tr>
<th>Title</th>
<th>Aerodynamic Principles for Automotive Design</th>
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<tbody>
<tr>
<td>Course director</td>
<td>Prof. Dr. M. Rebhan</td>
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<tr>
<td>Course teacher(s)</td>
<td>Ms. Laura Brombach-Randall</td>
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<tr>
<td>ECTS credits</td>
<td>4</td>
</tr>
<tr>
<td>Directed study time</td>
<td><strong>3 SWS per week</strong></td>
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<td>(1 contact hour = 45 min)</td>
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<tr>
<td>Level</td>
<td>Bachelors</td>
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<td>Assessment method(s)</td>
<td>The module is assessed by a presentation (including team project work) and a written exam.</td>
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<td>Prerequisites</td>
<td>Bachelor students starting in their 3rd or 4th semester to their final year may be accepted.</td>
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<td>Background assumed</td>
<td>Engineering, Mathematics (Differential Equations), English 1 recommended, but not required and MATLAB</td>
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<td>Course aims</td>
<td>Learn something and have fun!</td>
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**Learning and teaching outcomes**

Having successfully completed the module students are expected to be able to:

1. Calculate or simulate a laminar flow field for a simple shape (e.g. blunt body, cone, ball or block) at low speeds.
2. Describe and perform a simple experiment (designed by the students in teams), e.g. to be provided
3. Write about it!

**Learning and teaching methods**

The module is Taught (T) to an international, intercultural and interdisciplinary audience through:

- lectures combined with practical exercises

Distance Learning (DL) is not available, but the course is supported by:

- Skype

**Syllabus plan and content**

Part 1 – Basics of low-speed fluid dynamics:

- Do some experiments
- Figure out what’s going on
- Describe what’s going on mathematically
- Describe what is happening verbally
- Present your experiment
**Part 2 – Automotive Design:**
- Be able to discuss the ins-and-outs of wing design for automotive purposes
- Heating/cooling units; underbelly of an automobile
- Exterior Design with various shapes
- Tour of a Car Manufacturer with an engineer as the tour guide – (hopefully, BMW or Audi)

<table>
<thead>
<tr>
<th>Core reading</th>
<th>Katz, Joseph PhD  <em>Race Car Aerodynamics: Designing for Speed (Engineering and Performance)</em>, Bentley Publishers 2006</th>
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**Course evaluation method(s)**
- Standardized questionnaire after 4 weeks: results to be discussed with students immediately.
- Standardized questionnaire at the end of the course: results to be published after grading is complete and marks have been published.

**Additional remarks**
- None

**Available in**
- Summer/Winter semester 2017/2018