

Modulbezeichnung: Stundenplankürzel: (Title)	AERODYNAMIC PRINCIPLES FOR AUTOMOTIVE DESIGN
Modulverantwortliche(r): (Module responsibility)	Prof. Dr. Ing. Matthias Rebhan
Dozent(in): (Course teachers)	Ms. Laura Brombach-Randall
Sprache: (Language of instruction)	English
Zuordnung zum Curriculum: (Degree programme)	Elective Module
Lehrform/SWS: (Teaching method / Hours per week (SWS))	Lecture, Class Discussion, Demonstrations, Practical Exercises 3 SWS
Arbeitsaufwand: (Workload)	Attendance time: 45 hours Private study, exam preparation: 75 hours
Kreditpunkte: (Number of ECTS credits)	4 ECTS
Voraussetzungen: (Prerequisites)	Engineering Mathematics (Differential Equations)
Verwendbarkeit: (Usability)	The module is not prerequisite for other modules. The module is open for all three bachelor programs of the FK 09 as well as for exchange students.
Lernziele/Kompetenzen: (Course objective)	Competence Level 2 „Understand“: <ul style="list-style-type: none"> Calculate or simulate a laminar flow field for a simple shape (e.g. blunt body, cone, ball or block) at low speeds. Competence Level 3 „Apply“: <ul style="list-style-type: none"> Describe and perform a simple aerodynamics experiment (designed by the students in teams) Competence Level 4 „Analyse“: <ul style="list-style-type: none"> Analyse the flight properties of an object in the aerodynamics experiment Improve the flight properties
Inhalt: (Course content)	Part 1 – Basics of low-speed fluid dynamics: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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)
Prüfungsform: (Assessment method)	modA 60% (presentation & tasks) schrP 40%

	The module is assessed by a presentation (including team project work) and an exam
Literatur: <i>(Recommended reading)</i>	KATZ Joseph, ©2006, Race Car Aerodynamics: Designing for Speed, Bentley Publishers, ASIN: B00NPNUQX0
<i>(Supplementary reading)</i>	Anderson, John D., <u>Fundamentals of Aerodynamics 5th Edition</u> , McGraw-Hill Companies, Inc. ©2011