Automotive Electronics and Sensors (English)

Module Title	Automotive Electronics and Sensors (English)
Module Title in English	Automotive Electronics and Sensors
Module Leader	Prof. Dr. sc. Techn. Klaus Thelen
Teaching Staff	Prof. Dr. Klaus Thelen
Courselanguage/	English, German

Code	**Workload**	**Credits**	**Semester**	**Semester Offered**	**Duration**
FES	180 h	6	5th semester	Every Winter semester	1 semester

1	**Type of Course**	**Scheduled Learning**	**Independent Study**	**Approx. Number of Participants**
	Lecture: 2 h/week Seminar: 1 h/week Practical Course: 2 h/week	5 h/week (= 75 h)	Total: 105 h	Lecture max. 150 bzw. 120 Seminar 15 Practical Course max. 15

2 Learning Outcomes / Competences

Upon successful completion of this module, students will have …

acquainted themselves with the special characteristics and specifications of electronic systems in vehicles.
understood the specific characteristics of the most important sensors and actuators and are able to select the appropriate components for any given problem.
learned about the relevant vehicle networks and can plan and test the communication of the components.
gathered insight into aspects concerning alternative drive technologies (electric traction) and development processes.

3 Contents

The fundamentals of electronic components and circuits
The special characteristics of automotive electronics, control units, sensors and actuators
The function and structure of vehicle electrical systems
The components of electric powertrains
Processes describing development, production and test of the relevant components Influence of Electromagnetic compatibility (EMC)

4 Teaching Methods

Lecture with an accompanying seminar and project work.

5 Content-Related Module Prerequisites

Fundamentals of electrical engineering and electronics; Fundamentals of microcontroller programming; Fundamentals of math and physics

6 Formal Module Prerequisites

none

7	**Type of Exams** Written exam (70%, 120 minutes), project work with presentation (30%)
8	**Prerequisite for the Granting of Credits** Successful passing of the module exam
9	**This Module Appears in:** **Course of Studies** — **Status** Angewandte Informatik_BPO2010 — Elective Module Angewandte Informatik_BPO2010 — Elected Specialization Angewandte Informatik_BPO2017 — Elective Module Mechatronik_BPO2013 — Elective Module Mensch-Technik-Interaktion_BPO2013 Elective Module Mensch-Technik-Interaktion_BPO2017 Elective Module Modules in English at HRW — Elected Specialization
10	**Weighting of Grade in Relationship to Final Grade** Weighting equals the proportion of module credits in relationship to the total number of grade-relevant credits
11	**Additional Information / Literature** Konrad Reif: 'Automobilelektronik: Eine Einführung für Ingenieure' Springer, Vieweg Dez 2014 Manfred Krüger: „Grundlagen der Kraftfahrzeugelektronik, Schaltungstechnik“ Hanser Verlag, München Najamuz Zaman: “Automotive Electronics Design Fundamentals” Springer Verlag 2015 William B. Ribbens: „Understanding Automotive Electronics“ Elsevier 2012