

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	5 h/week (= 75 h)	Total: 105 h	Lecture	max. 150 bzw. 120
	Seminar:	1 h/week			Seminar	15
	Practical				Practical	
	Course:	2 h/week			Course	max. 15
2	Learning Outcomes / Competences					
	<p>Upon successful completion of this module, students will have ...</p> <ul style="list-style-type: none"> 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					
	<ul style="list-style-type: none"> 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	<p>Type of Exams</p> <p>Written exam (70%, 120 minutes), project work with presentation (30%)</p>																
8	<p>Prerequisite for the Granting of Credits</p> <p>Successful passing of the module exam</p>																
9	<p>This Module Appears in:</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Course of Studies</th> <th style="text-align: left;">Status</th> </tr> </thead> <tbody> <tr> <td>Angewandte Informatik_BPO2010</td> <td>Elective Module</td> </tr> <tr> <td>Angewandte Informatik_BPO2010</td> <td>Elected Specialization</td> </tr> <tr> <td>Angewandte Informatik_BPO2017</td> <td>Elective Module</td> </tr> <tr> <td>Mechatronik_BPO2013</td> <td>Elective Module</td> </tr> <tr> <td>Mensch-Technik-Interaktion_BPO2013</td> <td>Elective Module</td> </tr> <tr> <td>Mensch-Technik-Interaktion_BPO2017</td> <td>Elective Module</td> </tr> <tr> <td>Modules in English at HRW</td> <td>Elected Specialization</td> </tr> </tbody> </table>	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
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	<p>Weighting of Grade in Relationship to Final Grade</p> <p>Weighting equals the proportion of module credits in relationship to the total number of grade-relevant credits</p>																
11	<p>Additional Information / Literature</p> <p>Konrad Reif: 'Automobilelektronik: Eine Einführung für Ingenieure' Springer, Vieweg Dez 2014</p> <p>Manfred Krüger: „Grundlagen der Kraftfahrzeugelektronik, Schaltungstechnik“ Hanser Verlag, München</p> <p>Najamuz Zaman: “Automotive Electronics Design Fundamentals” Springer Verlag 2015</p> <p>William B. Ribbens: „Understanding Automotive Electronics“ Elsevier 2012</p>																