

Module description: Electronics 1						
Module Code	t.BA.ETE.K1.19HS					
ECTS Credits	4					
Language of Instruction/Examination	German					
Organizational Unit	ISC Signal & WCOM					
Module Coordinator	Sigisbert Wyrsh					
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.					
Module Characteristic	Type 3a 2 lecture lessons per semester week and class+ 2 lab bi-weekly lessons per semester and half-class					
Module Description	In the Electronics 1 module (EK1), basic electronic circuits are analysed, calculated, simulated (LTspice) and designed, then built and measured in the laboratory.					
Module Content	<ul style="list-style-type: none"> -Feedback circuits with ideal operational amplifiers -Coupled circuits with ideal operational amplifiers -Single-supply operational amplifier circuits -Introduction to circuit simulation technology with LTspice XVII -Static and dynamic characteristics of PN, PIN and Schottky diodes -Functionality and characteristics of the MOS-FET MOS-FET as a power switch -Step-down and step-up converters -H-bridge circuits 					
Prerequisite Knowledge						
Learning Objectives (Competences)	Students...		Competencies	Taxonomies		
	The students know the functionality of ideal operational amplifiers and understand the data sheet information.		F	K1, K2, K3		
	Students can use LTspice XVII to simulate all (relevant) electronic circuits from EK1, EK2, EL1, EL2. They can parameterize LTspice.		F, M	K1, K2, K3, K4		
	You can calculate given circuits with (ideal) operational amplifiers, simulate and analyze them with LTspice and design variants yourself.		F	K3, K4, K5		
	The students know the static and dynamic behaviour of different types of diodes.		F	K1, K2		
	They know how MOS-FETs work and can use them in switch applications, especially in clocked step-down and step-up converters.		F, M	K1, K2, K3, K4		
	You know how a DC motor will operate on an H-bridge and can dimension the circuit		M, F	K2, K3, K4, K5		
Performance Assessment	End-of-module exam	Assessment	Length (min.)	Weighting	Form	
	written exam	Grade	90	80	acc. to module agreement	
	Performance assessment during the semester					
	Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form	
	written exam	Grade	45	20	acc. to module agreement	

Module description: Electronics 1

Classroom Attendance Requirement	None
Learning material	<ul style="list-style-type: none">• Ralf Kories, Heinz Schmidt-Walter Taschenbuch der Elektrotechnik Verlag Harri Deutsch, 736 Seiten, ca. Fr. 33.-, 11. Auflage, 2017 ISBN: 978 3 8085 5865 2• ZHAW-Bibliothek: "Elektronik für Ingenieure und Naturwissenschaftler", Ekbert Hering, Julian Endres Jürgen Gutekunst, 8. Auflage, 2021• Ralf Kories, Heinz Schmidt-Walter Taschenbuch der Elektrotechnik Verlag Harri Deutsch, 736 Seiten, ca. Fr. 33.-, 11. Auflage, 2017 ISBN: 978 3 8085 5865 2
Comments	