

Module description: Electricity 1			
Module Code	t.BA.XX.EL1.19HS		
ECTS Credits	4		
Language of Instruction/Examination	German		
Organizational Unit	ISC Signal & WCOM		
Module Coordinator	Martin Loeser		
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	This module covers the fundamental principles of electricity. It focuses on a sound understanding of electrostatics, basic circuit elements and different circuit analysis strategies.		
Module Content	<p>Fundamental concepts of electricity - charge, current, voltage, electric potential and electric energy</p> <p>Fundamentals of circuit analysis - Kirchhoff's equations</p> <p>Simple two-terminal devices - linear and non-linear resistors</p> <p>Temperature-dependent resistors</p> <p>Active two-terminal devices, ideal and linear sources, impedance matching</p> <p>Characteristics of various non-linear active two-terminal devices such as batteries or solar cells</p> <p>Linearity, superposition and equivalent circuits</p> <p>Formal methods for circuit analysis</p> <p>Capacitors as circuit elements - capacitance, energy and relation between voltage and charge</p> <p>Simple RC-circuits - description of behaviour over time, analysis of most important phenomena</p> <p>All theory is accompanied by practical lab work</p>		
Prerequisite Knowledge	https://gmppublic.zhaw.ch/GPMDocProdDPublic/2_Studium/2_02_Grundlagen_Studium/T_C_L_Modulauspraegungen_SM2025.pdf		
Learning Objectives (Competences)	Students...	Competencies	Taxonomies
	The students know and understand the fundamental laws of electrostatics .	F, M	K1, K2
	Students understand the principle of superposition and are able to simplify complex circuits by introducing equivalent circuits.	F, M	K1, K2, K3
	They are able to efficiently analyze simple DC-circuits.	M, F	K1, K2
	Students understand basic dynamic circuits such as RC-circuits.	M, F	K1, K2, K3

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Performance Assessment	End-of-module exam	Assessment	Length (min.)	Weighting	Form	
	written exam	Grade	90	60	acc. to module agreement	
	Performance assessment during the semester					
	report	Grade		20	acc. to module agreement	
	written exam	Grade	45	20	acc. to module agreement	
Classroom Attendance Requirement	None					
Learning material						
Comments						