

Module description: Power Engineering and Drive Technology			
Module Code	t.BA.ET.EAT.19HS		
ECTS Credits	4		
Language of Instruction/Examination	German		
Organizational Unit	IMS		
Module Coordinator	Alberto Colotti		
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 3b 2 lecture lessons per semester week and class+ 4 lab bi-weekly lessons per semester and half-class		
Module Description	Students acquire the basics of electrical drive systems, including knowledge of the electrical grid, the three-phase theory and transformers. Requirements and design issues of drive systems are covered, as are the main components and behaviour of machines and power electronics for electrical drives.		
Module Content	<p>Power grid systems - Basic components and structure of the electrical grid -three-phase theory, apparent, active and reactive power -electrical transformer (operation mode, load cases, three phase transformer in Y/D connection)</p> <p>Dimensioning of electrical drives - basic mechanical and electrical theory (power, forces, torque) - application and requirements (examples and standards) - design and types of drive systems (structures, properties)</p> <p>DC Motor drives - Permanent magnet DC Motor (structure, magnetic circuit, properties and parameters) - power electronics components and basic concept (Buck Converter, Synchronous Rectifier and H-Bridge as DC Motor Supply)</p> <p>Electronic Commutated Motors - Structure, components and function of the EC Motor - three phase bridge as drive of EC-Motors, six-step mode</p> <p>Drives with Induction Machines - Squirrel cage induction motor, structure, components and function - Soft Starter</p> <p>Stepper Motors - Topologies and properties - Hybrid Stepper Motors - drives, full- and microstepping</p>		
Prerequisite Knowledge	Basics of electricity and electronics		
Learning Objectives (Competences)	Students...	Competencies	Taxonomies
	They know about the requirements to design an electrical drive to meet the needs for a specific application	M, F	K2, K3, K4
	They know the most important properties of the components of a power electronic system and are able to explain their main characteristic values	F, M	K2, K3, K4
	They can explain the function of the most important electrical drive systems	F	K2, K3
	Students know the structure of the electrical power network and can explain the function of the main components	F	K2

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Performance Assessment	End-of-module exam	Assessment	Length (min.)	Weighting	Form	
	written exam		60	60	acc. to module agreement	
	Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form	
	written exam	Grade	60	20	acc. to module agreement	
Lab-Exercises	predicate	180	20	acc. to module agreement		
Classroom Attendance Requirement	None					
Learning material	<ul style="list-style-type: none"> • Hagl, R. (2013). Elektrische Antriebstechnik. 4 Edition. Carl Hanser. ISBN 978-3-446-43350-2. 					
Comments						