

Module description: Materials Engineering 2	
Module Code	t.BA.MT.WT2.19HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IMPE
Module Coordinator	Arnd Jung
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	Materials Engineering 2 covers the properties and applications of the most important metallic materials used in mechanical engineering. Students are also shown how heat treatments are used to adjust the properties of metallic materials.
Module Content	<p>Lectures</p> <p>soft annealing, stress relief annealing</p> <p>recovery, recrystallisation</p> <p>strengthening mechanisms</p> <p>precipitation hardening</p> <p>TTT diagrams</p> <p>hardening, nitriding</p> <p>case studies: cold working, specification of heat heat treatments</p> <p>Metallic materials:</p> <p>steels</p> <p>cast iron</p> <p>aluminium alloys</p> <p>titanium alloys</p> <p>magnesium alloys</p> <p>case studies of manufacturing technologies: extrusion, deep drawing, die casting, thixocasting</p> <p>Practical training in the lab</p> <p>5 experiments, 4 lessons each, teamwork:</p> <p>Hardening and tempering of steels</p> <p>Fatigue behaviour of metallic materials</p> <p>Surface characterisation</p> <p>Case Study "Failure analysis"</p>

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Prerequisite Knowledge						
Learning Objectives (Competences)	Students...		Competencies	Taxonomies		
	Know and utilise properties and differences of metallic materials, their applications and heat treatments		F, M	K2, K3		
	Derive correlation between material, manufacturing method and resulting material properties		F, M	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		Assessment	Length (min.)	Weighting	Form
	written exam		Grade		20	acc. to module agreement
Classroom Attendance Requirement	None					
Learning material						
Comments						