


Data:	Examination number: 50120	Version: 11.06.2024 	Start Year: SoSe 2025
Module Name:	Materials Science and Mechanical Properties of Metals		
(English):			
Responsible:	Biermann, Horst / Prof. Dr.-Ing. habil Leineweber, Andreas / Prof. Dr. rer. nat. habil.		
Lecturer(s):	Weidner, Anja / Dr.-Ing. habil. Martin, Stefan / Dr.-Ing.		
Institute(s):	Institute of Materials Engineering Institute of Materials Science		
Duration:	1 Semester(s)		
Competencies:	The student is able to relate problems from engineering practice to fundamental concepts from Materials Science. Further the student is able to relate technological aspects of processing of metallic materials to changes in microstructure, the mechanical parameters and further properties.		
Contents:	<p>The first part of the lectures deals with the basics of materials science (structure, classes of materials), the main properties and the application of materials. The second part of the lecture deals with the (micro-)structure - properties relations of metallic materials. Focus is given to plastic deformation and failure, particularly to following metal alloy types:</p> <ul style="list-style-type: none"> • Ferrous metals (plain carbon steels, high-alloyed steels, cast irons); • Non-ferrous metals (e.g. copper, nickel) • Light metals (aluminum, titanium, magnesium) • High-temperature alloys (superalloys, intermetallic alloys) 		
Literature:	<p>Askeland, D.R., The Science and Engineering of Materials, Chapman and Hall, London etc. Schatt, W.; Worch, H., Werkstoffwissenschaft, Deutscher Verlag für Grundstoffindustrie. W. D. Callister, jr. Materials Science and Engineering – An Introduction, New York etc.: John Wiley & Sons. Inc.</p> <p>M. F. Ashby, D.R.H. Jones, Engineering materials 2, 2nd ed., Butterworth-Heinemann, Oxford, 1998</p> <p>James F. Shackelford, Introduction to Materials Science for Engineers, 7th ed. Addison Wesley., 2009</p>		
Types of Teaching:	S1 (SS): Lectures (4 SWS) S1 (SS): Exercises (1 SWS)		
Pre-requisites:	Recommendations: Basic fundamentals of physics, chemistry and solid materials		
Frequency:	yearly in the summer semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: KA [120 min]		
	Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst: KA [120 min]		
Credit Points:	7		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): KA [w: 1]		
Workload:	The workload is 210h. It is the result of 75h attendance and 135h self-studies.		