


Data:	FUNMICRO. MA. Nr. 3209 / Examination number: 44501	Version: 23.03.2022 	Start Year: WiSe 2018
Module Name:	Fundamentals of Microstructures		
(English):			
Responsible:	Eidel, Bernhard / Prof. Dr.-Ing. habil.		
Lecturer(s):	Eidel, Bernhard / Prof. Dr.-Ing. habil.		
Institute(s):	Institute of Mechanics and Fluid Dynamics		
Duration:	1 Semester(s)		
Competencies:	The students will learn theoretical aspects of microstructural elements in real crystalline materials and their links to different physical properties. They will become able to solve problems of materials scientific relevance. Furthermore, students will be able to transfer their knowledge to new problems. During the practical part of this module, students will additionally learn to apply computational methods that can be used to visualize, analyze and model chosen aspects of microstructures.		
Contents:	Most important topics are: Atomic interactions, crystallography, point defects, dislocations, grain boundaries, strengthening mechanisms, diffusion characteristics and the characteristic length scale associated with each of these elements.		
Literature:	W.D. Callister and D.G. Rethwisch: Materials Science and Engineering, an introduction D. Hull and D.J. Bacon: Introduction to dislocations R. Phillips: Crystals, Defects and Microstructures, Modeling across length scale. A.S. Argon: Strengthening Mechanisms in Crystal Plasticity		
Types of Teaching:	S1 (WS): Lectures (2 SWS) S1 (WS): Exercises (2 SWS)		
Pre-requisites:	Recommendations: basic programming/scripting experience in Python (which will be used throughout the lecture and tutorials). This is satisfied by simultaneously participating in the module „Software Tools for Computational Materials Scientists“.		
Frequency:	yearly in the winter semester		
Requirements for Credit Points:	For the award of credit points it is necessary to pass the module exam. The module exam contains: MP/KA (KA if 6 students or more) [MP minimum 30 min / KA 120 min] PVL: Home work assignments PVL have to be satisfied before the examination.		
Credit Points:	5		
Grade:	The Grade is generated from the examination result(s) with the following weights (w): MP/KA [w: 1]		
Workload:	The workload is 150h. It is the result of 60h attendance and 90h self-studies.		