


Data:	RecSRM. MA. Nr. / Examination number: -	Version: 24.07.2023 	Start Year: WiSe
Module Name:	Recycling - Secondary Raw Materials		
(English):	Recycling - Secondary Raw Materials		
Responsible:	Peuker, Urs Alexander / Prof. Dr.-Ing. Charitos, Alexandros / Prof.		
Lecturer(s):	Peuker, Urs Alexander / Prof. Dr.-Ing. Charitos, Alexandros / Prof.		
Institute(s):	Institute of Mechanical Process Engineering and Mineral Processing Institute for Nonferrous Metallurgy and Purest Materials		
Duration:	1 Semester(s)		
Competencies:	<p>The students will be able to link the applied module to the engineering and scientific fundamentals they have learned during their education. They will get an overview on selected process designs in the recycling of secondary raw materials. They will be able to analyze and understand the individual process steps of mechanical and metallurgical recycling. They will be aware of the interlink between mechanical and metallurgical recycling approaches. Finally, they be able to apply this knowledge to describe technical issues quantitatively.</p>		
Contents:	<p>There is a theoretical introduction into different quantitative methods / process steps, which are relevant in recycling, e.g.</p> <ul style="list-style-type: none"> • Waste regulation • Logistics / quality control • Shredding • Mechanical sorting (magnetic, electrostatic, eddy current, density, sensor based, ...) • Metallurgical • Emissions <p>Building on the microprocesses of particle technology (c.f. Training in Particle Technology) and fundamental knowledge in chemistry and thermodynamics, various technical process and related apparatus or machine technology of recycling technology are introduced including:</p> <ul style="list-style-type: none"> • Battery recycling • ELV recycling • Plastics recycling • Non-ferrous metal recycling • Aluminum recycling • Tin recycling • Slag recycling • 1-2 additional topics 		
Literature:	<p>H. Martens, D. Goldmann, Recyclingtechnik, Springer, Berlin, 2016 H. Schubert: Handbuch der Mechanischen Verfahrenstechnik, Wiley-VCH, Weinheim, 2003 Selected scientific papers</p>		
Types of Teaching:	<p>S1 (WS): Lectures (3 SWS) S1 (WS): Seminar (1 SWS)</p>		
Pre-requisites:	<p>Recommendations: Training in Particle Technology, 2022-09-15 Grundlagen der Mechanischen Verfahrenstechnik, 2020-04-06 Mechanische Verfahrenstechnik, 2020-04-07</p>		
Frequency:	yearly in the winter semester		
Requirements for Credit	For the award of credit points it is necessary to pass the module exam.		

Points:	<p>The module exam contains:</p> <p>in examination variant 0: MP/KA (KA if 8 students or more) [MP minimum 20 min / KA 150 min] PVL: report</p> <p style="text-align: center;">or</p> <p>in examination variant 1: MP [20 to 30 min] PVL: report Examination variant 1 provided for "TUBAF digital" PVL have to be satisfied before the examination.</p>
Credit Points:	6
Grade:	<p>The Grade is generated from the examination result(s) with the following weights (<i>w</i>):</p> <p>in examination variant 0: MP/KA [<i>w</i>: 1]</p> <p style="text-align: center;">or</p> <p>in examination variant 1: MP [<i>w</i>: 1]</p>
Workload:	<p>The workload is 180h. It is the result of 60h attendance and 120h self-studies. The latter includes the preparation and follow-up of the lecture course, the preparation and follow-up of the seminar including reporting, as well as the preparation for the written exam.</p>