DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
MWT302	4			7
Title	**T**	**A**	**L**	**ECTS**
Material Production and Processing Technologies	2	2	1	6

Language	German					
Level	**Undergraduate**	**X**	**Graduate**		**Postgraduate**	
Department / Program	Energy Science and Technology					
Forms of Teaching and Learning	Face-to-face					
Course Type	**Compulsory**	**X**	**Elective**			
Objectives	The aim is to develop students' analytical thinking skills, teach material production methods and technologies, and cover processes related to raw material acquisition, processing, and recycling.					
Content	The course content includes topics such as the design of structural components based on material properties, raw material acquisition and processing, casting technologies, sintering technologies, coating and thin-film coating technologies, plastic forming methods, joining processes, recycling, and resource efficiency.					
Prerequisites	None					
Coordinator	Dr. Sebastian Klemenz					
Lecturer(s)	Dr. Sebastian Klemenz					
Assistant(s)	None					
Work Placement	None					

Recommended or Required Reading	
Books / Lecture Notes	Materials for Engineering, J. W. Martin. The Institute of Materials, London
Other Sources	• B. Ilschner, R. Singer, Werkstoffwissenschaften und Fertigungs-technik, 5. Auflage, Springer, 2010 • E. Hornbogen, G. Eggeler, E. Werner, Werkstoffe, 9. Auflage, Springer, 2008 • W. D. Callister, Jr., Materials Science and Engineering, International Student Version, 8th Edition, Wiley, 2010 • Manufacturing with Materials, Edwards, Endean, Butterworth • Materials Science and Engineering, R. W. Cahn et al. VCH-Verlag • The Production of Inorganic Materials, J. W. Evans, L. C. DeJonghe, Mc Millan • Materials for Engineering, J. W. Martin. The Institute of Materials, London

Additional Course Material	
Documents	-
Assignments	-
Exams	1 Midterm, 1 Final

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Course Composition		
Mathematics und Basic Sciences	10	%
Engineering	70	%
Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge	20	%

Assessment		
Activity	**Count**	**Percentage (%)**
Midterm Exam	1	40
Quiz		
Assignments		
Attendance		
Recitations		
Projects		
Final Exam	1	60
	Total	**100**

ECTS Points and Work Load			
Activity	**Count**	**Duration**	**Work Load (Hours)**
Lectures	14	2	28
Self-Study	8	7	56
Assignments	6	3	18
Presentation / Seminar Preparation			
Midterm Exam	1	3	3
Recitations			
Laboratory			
Projects	3	6	18
Final Exam	1	3	3
		Total Work Load	**168**
		ECTS Points (Total Work Load / Hour)	**6**

Learning Outcomes	
1	Learns material production methods and technologies.
2	Learns raw material extraction techniques.

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3	Gains knowledge about casting and powder metallurgy.
4	Gains knowledge about post-production processing techniques.
Weekly Content	
1	Introduction to Material Production Methods
2	Classification of Material Production Methods
3	Component Design Based on Material Properties
4	Raw Material Extraction and Processing - 1
5	Raw Material Extraction and Processing - 2
6	Casting Process - 1
7	Casting Process - 2
8	Midterm Exam
9	Sintering Technology - 1
10	Sintering Technology - 2
11	Coating and Thin Film Process - 1
12	Coating and Thin Film Process - 2
13	Shaping Processes
14	Joining Methods
15	Recycling and Resource Efficiency
16	End-of-Semester Exam

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7	P8	P9
Ö1				2		3			
Ö2				2		3			
Ö3				2		3			
Ö4				2		3			

Contribution Level 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

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