

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 student gets an initial insight into raw material extraction techniques and downstream processing techniques for the production of materials and components by melt or powder metallurgical methods. This includes addressing the relevant theoretical foundations. The student manages to draw parallels between the processing of materials and their properties. Gains an initial qualification to select material-specific machining routes for the design and manufacture of components. It also gains an expanded level of proficiency in selecting and applying appropriate coating and bonding processes. Along with the main topics mentioned above, resource conservation and recycling issues are introduced to the student.					
Content	1) Component design based on material properties 2) Raw material extraction and processing 3) Casting process 4) Sintering technology 5) Coating and thin film processes 6) Forming processes 7) Join processes 8) Recycling and resource efficiency					
Prerequisites	None					
Coordinator	Dr. -Ing. Çağatay ELİBOL					
Lecturer(s)	Dr. -Ing. Çağatay ELİBOL					
Assistant(s)						
Work Placement	None					
Recommended or Required Reading						
Books / Lecture Notes	Materials for Engineering, J. W. Martin. The Institute of Materials, London					
Other Sources	1) B. Ilchner, R. Singer, Werkstoffwissenschaften und Fertigungs-technik, 5. Auflage, Springer, 2010 2) E. Hornbogen, G. Eggeler, E. Werner, Werkstoffe, 9. Auflage, Springer, 2008 3) W. D. Callister, Jr., Materials Science and Engineering, International Student Version,8th Edition, Wiley, 2010 4) Manufacturing with Materials, Edwards, Endean, Butterworth 5) Materials Science and Engineering, R. W. Cahn et al. VCH-Verlag					

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	6) The Production of Inorganic Materials, J. W. Evans, L. C. DeJonghe, Mc Millan		
Additional Course Material			
Documents			
Assignments			
Exams			
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	3	42
Self-Study	14	7	98
Assignments	6	3	18
Presentation / Seminar Preparation			
Midterm Exam	1	3	3
Recitations			
Laboratory			
Projects	3	6	18
Final Exam	1	3	3

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Total Work Load		182
ECTS Points (Total Work Load / Hour)		6
Learning Outcomes		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
Weekly Content		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Contribution of Learning Outcomes to Program Objectives (1-5)		

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	P1	P2	P3	P4	P5	P6	P7
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
Contribution Level		1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High					
<p><b>P1 Working with modern scientific sources.</b></p> <p><b>P2 Having modern scientific knowledge and scientific analysis abilities and being able to apply them to scientific problems.</b></p> <p><b>P3 Having theoretical and practical skills in the area of Energy Science and Technology.</b></p> <p><b>P4 Having foreign language skills to follow the worldwide advancements in the field of Energy Science and Technology and to be able to discuss them with foreign colleagues.</b></p> <p><b>P5 Having computational skills for research data analysis purposes.</b></p> <p><b>P6 Having appropriate skills for academic and industrial jobs, being ready to take responsibility in working life.</b></p> <p><b>P7 Having knowledge about work occupational work and safety.</b></p>							
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