

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGIES
COURSE SYLLABUS

Course Details					
Code				Academic Year	Semester
EBT324				2	4
Title	T	A	L	ECTS	
Heterogeneous Catalysis	2	2	0	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		Elective	X	
Objectives	Obtaining general information about catalysts, catalytic reactions and catalysts characterization				
Content	1. General information about catalysis and catalysts 2. Homogeneous catalysis 3. Heterogeneous catalysis 4. Adsorption, adsorption isotherms, adsorption and its application 5. Mechanism and kinetics of heterogeneous catalytic reactions 6. Important heterogeneous catalytic reactions 7. Mechanism and kinetics of enzymatic reactions 8. Catalysts characterization methods				
Prerequisites	No				
Coordinator	Assist. Prof. Dr. Meltem Karaismailoğlu Elibol				
Lecturer(s)	Assist. Prof. Dr. Meltem Karaismailoğlu Elibol				
Assistant(s)					
Work Placement	No				
Recommended or Required Reading					
Books / Lecture Notes					
Other Sources	Fogler, H. S. (1999). Elements of chemical reaction engineering. Upper Saddle River, N.J. :Prentice Hall PTR Thomas J. M. ve Thomas W. J. (2015). Principles and practise of heterogeneous catalysts, VCH Behr A., Agar D. W. Ve Jörissen J. (2009). Einführung in die Technische Chemie, Springer Niemantsverdriet J. W. (2007). Spectroscopy in Catalysis, VCH				
Additional Course Material					
Documents					
Assignments					
Exams					
Course Composition					
Mathematics und Basic Sciences					%

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Engineering			%
Engineering Design			%
Social Sciences			%
Educational Sciences			%
Natural Sciences	100		%
Health Sciences			%
Expert Knowledge			%
Assessment			
Activity	Count		Percentage (%)
Midterm Exam	1		30
Quiz			
Assignments			
Attendance			
Recitations			
Projects	1		20
Final Exam	1		50
	Total		100
ECTS Points and Work Load			
Activity	Count	Duration	Work Load (Hours)
Lectures	15	2	30
Self-Study	15	6	90
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	15	2	30
Laboratory			
Projects	1	30	30
Final Exam	1	2	2
	Total Work Load		184
	ECTS Points (Total Work Load / Hours)		6
Learning Outcomes			
1	Ability to apply mathematics, natural science and its applications		
2	The consciousness of life-long learning necessity		
3	Professional and ethical responsibility		
4	Ability to communicate effectively		

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Weekly Content									
1	Historical development of surface science and catalysis, general information about catalysis and catalysts								
2	Homogeneous catalysis								
3	Heterogeneous catalysis								
4	Adsorption, adsorption of gases on solid materials								
5	Adsorption isotherms, adsorption of dissolved materials on solids								
6	Adsorption and its application								
7	Mechanism and kinetics of heterogeneous catalytic reactions								
8	Midterm								
9	Important heterogeneous catalytic reactions								
10	Enzymatic catalysis								
11	Mechanism and kinetics of enzymatic reactions								
12	Catalysts characterization methods								
13	Catalysts characterization methods								
14	Project work								
15	Project work								
Contribution of Learning Outcomes to Program Objectives (1-5)									
	P1	P2	P3	P4	P5	P6	P7	P8	P9
1	4	4	4	4	4	4	4	4	4
2	4	4	4	4	4	4	4	4	4
3	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4
5	4	4	4	4	4	4	4	4	4
Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High								
Compiled by:	Assist. Prof. Dr. Meltem Karaismailoğlu Elibol								
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