

DEPARTMENT OF MATERIALS SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

Course Details				
Code	Academic Year			Semester
NWI208	2			4
Title	T	A	L	ECTS
Heterogeneous Catalysis	2	2		6
Language	German			
Level	Undergraduate	X	Graduate	Postgraduate
Department / Program	Materials 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				
Coordinator				
Lecturer(s)				
Assistant(s)				
Work Placement	No			
Recommended or Required Reading				
Books / Lecture Notes	1. Fogler, H. S. (1999). Elements of chemical reaction engineering. Upper Saddle River, N.J. :Prentice Hall PTR 2. Thomas J. M. ve Thomas W. J. (2015). Principles and practise of heterogeneous catalysts, VCH 3. Behr A., Agar D. W. Ve Jörisen J. (2009). Einführung in die Technische Chemie, Springer 4. Niemantsverdriet J. W. (2007). Spectroscopy in Catalysis, VCH			
Other Sources				
Additional Course Material				
Documents				
Assignments				
Exams				
Course Composition				

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Mathematics und Basic Sciences			%
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		

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4	Ability to communicate effectively
5	
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12	

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	Important heterogeneous catalytic reactions
9	Enzymatic catalysis
10	Mechanism and kinetics of enzymatic reactions
11	Catalysts characterization methods
12	Catalysts characterization methods
13	Project work
14	Project work
15	Project work

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

	P1	P2	P3	P4	P5	P6	P7
1	3	2	3	3	1	2	1
2							
3							
4							
5							
6							
7							
8							



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9							
10							
11							
12							
Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High						
Compiled by:							
Date of Compilation:							