AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title		Catalyst							
Course Code		KİM537		Couse Level		Second Cycle (Master's Degree)			
ECTS Credit	6	Workload	150 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The first objective is to increase the students' awareness of the omnipresence of catalysis in the field of chemistry and particularly in petrochemistry, fine synthesis chemistry (pharmacy, perfumery) and environmental protection (air and water purification, pollution prevention). The second objective is to provide the students required knowledge on the catalytic process, drawing their attention on the parameters influencing the catalytic performances, in order to improve the catalytic systems performances and their lifetime. The third objective is to give the students homogeneous catalysts synthesis methods.							
Course Content		Definition and classification of the catalyst, catalyst types: homogeneous and heterogeneous catalysts, catalytic steps and the factors affecting the activity of catalysts.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods			Explanation (Presentation), Discussion, Problem Solving						
Name of Lecturer(s)		Assoc. Prof. Rukiye FIRINCI, Prof. Muhammet Emin GÜNAY							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	60
Quiz	4	10
Assignment	4	10

Recommended or Required Reading

1	P.W.N.M. van Leeuwen, Homogeneous Catalysis, Kluwer Academic Publishers, Dordrecht 2004.
2	N. Miyaura, Cross-Coupling Reactions, Springer 2002.

Week	Weekly Detailed Course Contents		
1	Theoretical	Definition and classification of the catalyst	
2	Theoretical	Catalyst types: homogeneous and heterogeneous catalysts	
3	Theoretical	Catalytic steps and the factors affecting the activity of catalysts	
4	Theoretical	Hydroformylation of alkenes	
5	Theoretical	Monsanto process	
6	Theoretical	Buchwald-Hartwig amination	
7	Theoretical	Cross-coupling reactions: Suzuki-Miyaura, Heck, Sonogashira, Kumada	
8	Intermediate Exam	Midterm Exam	
9	Theoretical	Palladium catalysts for the formation of C-N and C-O bond	
10	Theoretical	Transfer hydrogenation, asymmetric transfer hydrogenation	
11	Theoretical	Polymerization of olefins	
12	Theoretical	Hydrosilylation	
13	Theoretical	Furan formation, cyclopropanation, allylic alkylation	
15	Theoretical	Olefin metathesis: RCM, ROM, ROMP	
16	Final Exam	Final Exam	

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42

Assignment	4	6	0	24
Reading	1	0	30	30
Quiz	4	4	1	20
Midterm Examination	1	10	2	12
Final Examination	1	20	2	22
			Total Workload (Hours)	150
			[Total Workload (Hours) / 25*] = **ECTS**	6

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	to be able to define and classify the catalyst.
2	to be able to review catalytic steps and draw catalytic cycle.
3	to be able to recognize the role of transition metals on the catalytic activity.
4	to be able to recognize the different types of model catalytic reactions.
5	to be able to define and draw the catalytic cycle for organic reactions.
6	to be able to recognize the types of catalyst widely used in industry.

Programme Outcomes *(Chemistry Master)*

1	To be able to gain proficiency in depths and analysis by statistical methods in the same or a related area depending on the undergraduate competence,.
2	To be able to use the knowledge of his/her field and the skills to solve problems and/or applications in interdisciplinary research.
3	To be able to adopt to evaluate the information and skill his/her field by critical approach.
4	To be able to evaluate the effect of important persons, case and fact on his/her field applications.
5	To be able to gain the ability to discuss write and orally present to a group of literate listener.
6	To be able to communicate orally and written in a foreign language at least at European language B2 level.
7	To be able to use computer programs related to his/her field and have skills for informatics communication.
8	To be able to be careful in protecting social, scientific and cultural ethics in collection data, application and presentation.
9	To be able to develop strategic, political and application plans in his/her field and may evaluate the outcomes in quality periods.

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5	L6
P1	5	5	5	5	5	5
P2	5	5	5	5	5	5
P3	5	5	5	5	5	5
P5	3	3	3	3	3	3
P9	4	4	4	4	4	4