

1. Course Description

COURSE DESCRIPTION FORM	
Course Code and Title	CHE444 CATALYSTS AND CATALYTIC REACTIONS
Course Semester	8
Catalog Description (Content) of the Course	General properties and structure of the catalysts. Synthesis, preparation techniques and characterization of catalysts. Catalytic reactions and mechanisms. Catalytic reactors.
Main Textbook	Richardson T. J., Principles of Catalysts Development, FAC, Plenum Press, N.Y. 1989. 2. Gates B. C., Catalytic Chemistry, Wiley & Sons, Inc. NY., 1992 3. Smith, J.M., "Chemical Engineering Kinetics", 3rd Edition, Mc Graw Hill, 1981.
Supporting Textbooks	Wiley & Sons, Inc. NY., 1992 3. Smith, J.M., "Chemical Engineering Kinetics", 3rd Edition, McGraw Hill, 1981.
Course Credit (ECTS)	4
Prerequisites of the Course (Compulsory attendance should be indicated here.)	There is no prerequisite or co-requisite for this course. Attendance of the course must be 70%.
Type of the Course	Elective
Instruction Language of the Course	English
Object and Target of the Course	Catalysts, synthesis methods, applications, the methods of characterization techniques.
Learning Outcomes of the Course	1. Teach to main concepts of catalytic reactions and catalysts used in chemical reactors 2. Teach to techniques of catalysts preparation and characterization of catalysts 3. The ability to design a catalysts of any reactions 4. Ability to use of thermodynamics and physical data 5. Ability to form a working group 6. The ability to get communication skills in writing and presenting
Mode of Delivery	Face to Face
Weekly Schedule of the Course	1. Week: Catalytic Reactions and Catalysts 2-3. Week: Catalysts types, structures and properties 4-5. Week: Techniques of preparation and improvement of catalysts 6-7. Week: Catalysts characterizations 8. Week: Reaction mechanism and kinetics 9. Week: Catalyst activity test methods 10. Week: Catalyst deactivation 11. Week: Principles of design 12. Week: Temperature effects 13. Week: Design Applications 14. Week: Design Applications
Educative Activities <i>(Credit will be determined based on the time given for these activities. Should be filled carefully.)</i>	Theoretical Study Hours of Course Per Week Searching in Internet and Library Preparing Reports Mid-Term and Studying for Mid-Term Final and Studying for Final

Assessment Criteria		Quantity	Total Contribution (%)						
	Midterm	1	30						
	Homework	3	10						
	Assignment	0	0						
	Projects	1	20						
	Practice	0	0						
	Quiz	0	0						
	Contribution of In-term Studies to Overall Grade		60						
	Contribution of Final Examination to Overall Grade		4						
	Attendance	0	70%						
Workload of the Course	Activity	Total Week Count	Weekly Duration (in hour)	Total Workload in Semester					
	Theoretical Study Hours of Course Per Week	14	3	42					
	Searching in Internet and Library	14	2	28					
	Preparing Reports	1	3	3					
	Presentation	1	5	5					
	Final and Studying for Final	13	1	13					
	Total work load			91					
	Total work load/25			3,64					
	ECTS of the course			4					
Course's Contribution To Program	Number	Program Outcomes		1	2	3	4	5	
	1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			X				
	2	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.			X				
	3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. (Realistic constraints and conditions may include factors such as economic and environmental issues, sustainability, manufacturability, ethics, health, safety issues, and social and political issues, according to the		X					

		nature of the design.)						
	4	Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.	X					
	5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.			X			
	6	Ability to work efficiently in intra-disciplinary teams.			X			
	7	Ability to work efficiently in multi-disciplinary teams	X					
	8	Ability to work individually.			X			
	9	Ability to communicate effectively in Turkish/English, both orally and in writing; Ability to write effective reports and comprehend written reports, make effective presentations,		X				
	10	Prepare design and production reports, give and receive clear and intelligible instructions		X				
	11	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.	X					
	12	Awareness of professional and ethical responsibility.		X				
	13	Information about business life practices such as project management, risk management, and change management.	X					
	14	Information about awareness of entrepreneurship, innovation, and sustainable development.	X					
	15	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X				
16	Knowledge about awareness of the legal consequences of engineering solutions.	X						
17	Knowledge on standards used in engineering practice	X						
Name of Lecturer(s) and Contact Information		1. Prof.Dr.Nuray OKTAR: oktarnuray@gmail.com 2. Prof.Dr.Suna BALCI: sunabalci@gazi.edu.tr 3. Prof.Dr.Çiğdem GÜLDÜR: cguldur@gazi.edu.tr						