1. Course Description

COURSE DESCRIPTION FORM	
Course Code and Title	CHE475 FLUIDIZED BED REACTOR DESIGN
Course Semester	7
Catalog Description (Content) of the Course	Types and hydrodynamics of fluidized bed reactors. Movements of fluid and solid inside the bed. Heat transfer, mass transfer and chemical reactions in fluidized beds. Design of fluidized bed reactors. Specific project applications.
Main Textbook	• Fundamentals of Fluidized Bed Chemical Processes, J. G. Yates, Butterworths, London, 1983.
Recommended Textbooks	• Fluidized Bed Technology, J. R. Howard, Adam Hilger, Bristol and New York, 1989. • Gas Fluidization Technology, D. Geldart, John Wiley and Sons, Chicester, 1986. • Fluidization Engineering, D. Kunii and O. Levenspiel, 2nd Ed., Butterworth- Heinmann, 1991. • Fluidization, J. F. Davidson and H. Harrison, Academic Press, London, 1971.
Course Credit (ECTS)	4
Prerequisites of the Course (Compulsory attendance should be indicated here.)	There is no prerequisite or corequisite for this course. 70 % attendance is compulsory.
Type of the Course	Elective
Instruction Language of the Course	English
Object and Target of the Course	To learn the basic design and operational principles of fluidized bed reactors which have a growing number of application areas in chemical processes and application of them to several reactions.
Learning Outcomes of the Course	To learn the basic principles of design and operational principles of fluidized bed reactors. Application to several reactions in chemical processes.
Mode of Delivery	The mode of delivery of this course is face to face.
Weekly Schedule of the Course	1st Week: Introduction. Types of fluidized beds, processes using fluidized bed reactors. 2nd Week: The basic hydrodynamic parameters of fluidized beds. 3rd Week: Behavior of fluid and solid particles. 4th Week: Behavior of fluid and solid particles. 5th Week: Heat transfer in fluidized beds. 6th Week: Mass transfer in fluidized beds 7th Week: Chemical reactions in fluidized beds. 8th Week: Design of fluidized bed reactors and utilizing equipments. 9th Week: Design of fluidized bed reactors and utilizing equipments. 10th Week: Application of selected specific project and design of it. 11th Week: Application of selected specific project and design of it. 12th Week: Application of selected specific project and design of it. 13th Week: Application of selected specific project and design of it. 14th Week: Application of selected specific project and design of it..
Educative Activities *(Credit will be determined based on the time given for these activities. Should be filled carefully.)*	Weekly theoretical course hours Reading Web survey and library inquiry Material design and application Preparation of project report. Preparation of presentation and presenting. Midterm examinations and preparation for midterm exams

	Final examination and preparation for final exam

Assessment Criteria

	Quantity	Total Contribution (%)
Midterm	2	40
Homework	0	0
Assignment	0	0
Projects	1	15
Practice	0	0
Quiz	1	5
Contribution of In-term Studies to Overall Grade		60
Contribution of Final Examination to Overall Grade		40
Attendance		

Workload of the Course

Activity	Total Week Count	Weekly Duration (in hour)	Total Workload in Semester
Weekly theoretical hours for specific course	14	3	42
Weekly practice hours for specific course			
Reading	6	1	6
Web survey and library inquiry	6	2	12
Material design and application	3	2	6
Preparation of project report	3	3	9
Preparation of presentation	3	3	9
Presentation	1	1	1
Midterm examinations and preparation for midterm exams	5	4	20
Final examination and preparation for final exam	1	4	4
Other			0
Total work load			109
Total work load/25			4.36
ECTS of the course			4

Course's Contribution To Program

No	Program Learning 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.				X		
		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.						
		6	Ability to work efficiently in intra-disciplinary teams.			X			
		7	Ability to work efficiently in multi-disciplinary teams;						
		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			X			

			written reports, make effective presentations,						
		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.						
		14	Information about awareness of entrepreneurship, innovation, and sustainable development.						
		15	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.						
		16	Knowledge about awareness of the legal consequences of engineering solutions.						
		17	Knowledge on standards used in engineering practice.	X					

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