In the name of Allah

Kinetics and reactor design

Course code: 24-18-213-01

Course Credit: 4

Level: Undergraduate

Term: Second Term 1400-1401

Lecturer: Hossein Zohdi-Fasaei (Assistant Professor)

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Lecturing time: Sunday (07.30-09.30), Wednesday (07.30-09.30)

Recitation Sections: Virtual

Grading:

Activities	PERCENTAGES
Homework	10%
Quiz	10%
Mid-term exams (1 and 2)	40%
Final exam	40%
Computer Projects	Optional (10%)

Required Text:

Levenspiel, O. *Chemical Reaction Engineering*. 3rd ed. New York, NY: Wiley, 1999. ISBN: 9780471254249.

Recommended Texts:

Fogler, H. S. Elements of Chemical Reaction Engineering. 4th ed. Upper Saddle River, NJ: Prentice-Hall PTR, 2006. ISBN: 9780130473943

Smith, J. *Chemical Engineering Kinetics*. 3rd ed. New York, NY: McGraw-Hill, 1981. ISBN: 9780070587106

Calendar

LEC #	TOPICS	Contents
1	*Overview of Chemical Reaction Engineering*	*Preliminaries and remembrance of things past*
2	Overview of Thermodynamics	
3		
4	*Kinetics of Homogeneous Reactions*	The reaction rate and reaction mechanisms: Definition in terms of reacting compounds and reaction extent; rate laws, Arrhenius equation, elementary, reversible, non-elementary, catalytic reactions.
5		
6	*Introduction to Reactor Design*	
7	*Ideal Reactors for a Single Reaction*	*Ideal Batch Reactors*
8		Steady-State Plug Flow Reactors
9		
10		Steady-State Mixed Flow Reactors
11		
12	***Mid-term 1***	
13	*Ideal Reactors for a Single Reaction*	Recycle Reactor, Autocatalytic Reactions
14		*Transient reactors*
15		Multiple-Reactor Systems
16	***Mid-term 2***	
17	*Design for Parallel Reactions*	*Reactions in Series*
18		*Reactions in Parallel*
19		Irreversible Series-Parallel Reactions
20		Multiple-Reactor Systems
21		
22	*Temperature and Pressure Effects*	Single Reactions
23		Multiple Reactions
24	*Solving complicated Problems*	*Preparation for the Final Term Exam*

Recitation Sections

The purpose of the recitation section is to give you practice working difficult problems in a supportive environment, with a focus on moving from the problem statement to solvable systems of equations. We will also review homework solutions, discuss problem solving strategies, answer questions concerning lecture material, and discuss exam solutions. You must have read and thought about the homework problems before you come to recitation. Be prepared to be asked to do problems on the whiteboard.