

# RUTGERS UNIVERSITY

## Department of Chemical and Biochemical Engineering

155:441 Chemical Engineering Kinetics (3 credits)

SPRING 2017

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**Instructor:** Dr. Georgios (George) Tsilomelekis  
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Office hours: Thursdays 3:00-5:00pm, and by appointment

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**Teaching Assistants:** Rohit Rao: [rohit.rao14@rutgers.edu](mailto:rohit.rao14@rutgers.edu)  
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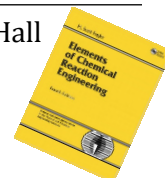
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**Textbook:** H. Scott Fogler, Elements of Chemical Reaction Engineering, 4th ed. Prentice Hall

**Lectures:** Tuesdays & Fridays at 8:40-10:00 am

**Web Page:** <http://sakai.rutgers.edu>

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### COURSE OBJECTIVES

This course presents the fundamental modeling and design procedures for chemical reactors found in industrial processes throughout the breadth of the chemical industries. In this course students learn to apply the principles of chemical kinetics, stoichiometry, equilibrium, mass and energy balances and transport phenomena to the analysis and design of chemical reactors. The relationship of reaction mechanisms to rate laws is investigated.

### HOMEWORK, EXAMS AND GRADING POLICY

**Homework:** Homework problems will be assigned, collected, and graded on a regular basis during the semester. All homework problems must be submitted **by the end of lecture** and no late homework will be accepted (zero points). Students are requested to turn in their homework assignments in-class (and not by email or using Sakai, unless specifically instructed otherwise). You may work in groups, but you may only submit your own original hand-written work.

**Midterm Exams:** During midterm exams, you will be allowed to use a pen and 1 page (both sides) of your own original hand-written notes. Write your name on each page of your notes and turn it in with your exam. **Use of computers, laptops, and cell phones is PROHIBITED during Midterm exams.**

**Final Exam:** During Final exam, you will be given an equation sheet with all the required information needed. **Use of personal hand-written notes is PROHIBITED during Final exam. Use of computers, laptops, and cell phones is also PROHIBITED during Final exam.**

Course grade:	Homework (7 out of 10):	15%
	Midterm exam 1 or 2 (lower):	20%
	Midterm exam 1 or 2 (higher):	30%
	Final exam:	45%

**Course schedule subject to change**

**Please follow announcements on the Sakai course webpage for any changes to the following schedule!**

	<i>Date</i>	<i>Topic</i>	<i>Fogler 4<sup>th</sup> ed. Sections</i>	<i>Midterms/Final</i>
<b>Week 1</b>	Tuesday 1/17	Introduction	1.1 - 1.5	
	<del>Friday 1/20</del>			
<b>Week 2</b>	Tuesday 1/24	Design Eq.	2.1 - 2.6	
	Friday 1/27			HW#1
<b>Week 3</b>	Tuesday 1/31	Rate Laws	3.1 - 3.6	
	Friday 2/3			HW#2
<b>Week 4</b>	Tuesday 2/7	Stoichiometry	5.1 - 5.7	
	Friday 2/10			HW#3
<b>Week 5</b>	Tuesday 2/14	MT1		MT1
	Friday 2/17	Parallel Reactions	6.1 - 6.3	PSS
<b>Week 6</b>	Tuesday 2/21			
	Friday 2/24	Isothermal Reactors	4.1 - 4.7	HW#4
<b>Week 7</b>	Tuesday 2/28			
	Friday 3/3	Catalysis	7.1	HW#5
<b>Week 8</b>	Tuesday 3/7			
	Friday 3/10	Catalytic Reactors	10.1 - 10.7	HW#6
<b>Week 9</b>	<del>Tuesday 3/14</del>			
	<del>Friday 3/17</del>			
<b>Week 10</b>	Tuesday 3/21	MT2		MT2
	Friday 3/24	Non-Isothermal Reactors	8.1 - 8.9	PSS
<b>Week 11</b>	Tuesday 3/28			
	Friday 3/31	Internal & External Transport Effects	11.1 - 11.4	HW#7
<b>Week 12</b>	Tuesday 4/4			
	Friday 4/7	9.1 - 9.2	12.1 - 12.2	HW#8
<b>Week 13</b>	Tuesday 4/11			
	Friday 4/14	11.1 - 11.4	12.1 - 12.2	HW#9
<b>Week 14</b>	Tuesday 4/18			
	Friday 4/21			HW#10   PSS
<b>Week 15</b>	Tuesday 4/25			
	Friday 4/28			Q & A session
<b>Week 16</b>	<b>TBD</b>	<b>FINAL EXAM</b>		<b>FINAL EXAM</b>

PSS= Problem Solving Session (in-class)

HW= Homeworks

MT- Midterm exams