Chemical and Biochemical Engineering 441 (14:155:441)
Chemical Engineering Kinetics
Fall 2013 (3 credits)
Tuesday, Thursday 1:40 – 3:00pm, Fiber Optics Auditorium

Instructor: Professor Fuat E. Celik (C-215 Engineering, 5-5558, fuat.celik@rutgers.edu)
Office hours: Tuesday 3:00 – 5:00 pm, and by appointment

TA: Deniz Dindi (C-203B Engineering, deniz.dindi@rutgers.edu)
Office hours: Monday and Wednesday 10:30 – 11:30 am, and by appointment

Grader: Ashley Pennington (C-203B Engineering, ashley.pennington@rutgers.edu)
Office hours: Wednesday 3:30 – 4:30 pm, and by appointment

Course info: https://sakai.rutgers.edu

Text: H. Scott Fogler, Elements of Reaction Engineering, 4th ed. Prentice Hall

Software: You will occasionally be required to write MATLAB or PolyMath programs to solve reaction engineering and reactor design problems.

Course grade:		
	Problem sets	10%
	Quizzes	10%
	Design project	20%
	Midterm exam	25%
	Final exam	35%

Problem sets: Problem sets will be collected at the end of class. All problem sets must be submitted by the end of lecture and no late homework will be accepted (zero points). For each problem set, several problems will be assigned. Solutions will be posted immediately after class. You may work in groups, but you may only submit your own original work.

Quizzes: Short quizzes will be held in the first 15 minutes of class in weeks where no problem set is due. You will be allowed to use a pen, pencil, eraser, and one page (both sides) of your own hand-written notes for quizzes. All backpacks, cellphones, calculators, textbooks, notebooks, problem sets etc. must be left against the wall in the front of the classroom. Write your name on the page of notes and turn it in with your quiz.

Design project: The design project will give you an opportunity to apply the concepts from the course to a real-life system involving chemical reaction kinetics. Teams of 2-4 students will select a reaction system, which you will model as one (or a series) of the basic reactor types you have learned about in this course. Each team will prepare a ~4 page report describing the system you are modeling and its significance, the reactor model(s) chosen, detailed material and energy balances, modeling approach, and results. Relevant facts and data are expected to be properly cited from reliable sources (scientific journal and reports, reference books etc.). There will be two short progress reports due (by email) before the final written report.

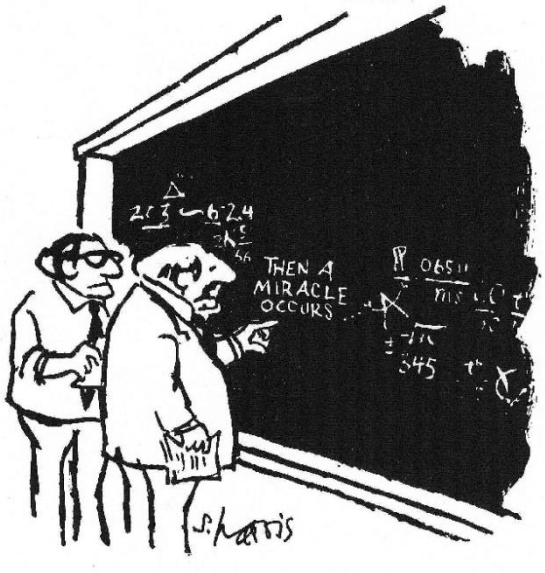
Exams: During exams, you will be assigned seats, and you will be allowed to use a pen, pencil, eraser, and one page (both sides) of your own hand-written notes for midterms, two pages of hand-written notes for the final exam. All backpacks, cellphones, calculators, textbooks, notebooks, problem sets etc. must be left against the wall in the front of the classroom. Write your name on the page(s) of notes and turn it in with your exam. The final exam will cover both new material as well as review material from the midterm exam.

Course Description: This course presents the fundamental modeling and design procedures for chemical reactors found in industrial processes throughout the breadth of the chemical industries. The application of principles of stoichiometry, mass and energy balances, and transport phenomena to reactors for homogeneous and heterogeneous systems is emphasized. The relationship of reaction mechanisms to rate laws is investigated.

Prerequisites:
14:155:304: Transport Phenomena in Chemical Eng. II
14:155:307: Chemical Engineering Analysis II
01:160:328: Physical Chemistry or 01:160:342: Physical Chemistry: Biochemical Systems

This is a required course in the Chemical and Biochemical Engineering curriculum.

Instructor's note: I strongly emphasize conceptual knowledge and understanding. You will be tested and graded on your ability to understand and utilize the fundamental concepts you will learn in this course. You must show all work, and do not skip any steps. In all graded work, leave all expressions in their algebraic form so that you will obtain a general expression for your answer. Only plug in numerical values at the very end, and always specify all units when plugging in values. Failure to follow these instructions will result in points taken off.



"I think you should be more explicit here in step two."