



Advanced Chemical Reaction Engineering

The University of Toledo
Chemical and Environmental Engineering
CHEE 6500/8500

Instructor:	Maria Coleman	Class Location:	Palmer 3040
Email:	maria.coleman6@utoledo.ed	Class Day/Time:	MW 9:30 am – 10:45 am
Office Hours:	TTh 1-2:00, MW 1-2:00	Lab Location:	NA
Office Location:	NE 2470	Lab Day/Time:	NA
Office Phone:	419-530-8091	Credit Hours:	3
Term:	Spring 2016		

COURSE/CATALOG DESCRIPTION

Analysis of kinetic, diffusive and flow factors on chemical reactor performance. Topics Include batch, plug flow and CSTR reactors, empirical rate expressions, residence time distributions, catalytic reactors, stability and optimization.

STUDENT LEARNING OUTCOMES

The students will be able to analyze and solve reactor design equations for multiple reactor types, the effect of pressure drop, temperature and multiple reactions will be address. The students will be able to develop reaction mechanisms and solve for rate expressions and compare to experimental data. The students will be able to analyze catalytic systems and determine rate limiting steps including diffusion, pore diffusion and reaction rate limited.

Topics

The following is list of topics addressed with reading material from Fogler text.

- Review of Reactor Design (Fogler Chp 1-4)
- Multiple Reactions (Fogler 6)
- Heat Effects in Reactions (Fogler 8)
- Catalysis (Fogler 9-11)
- Additional Topics

TEACHING STRATEGIES

The course consists of two primary lecture periods in which a new concepts will be introduced and example problems will be solved during course time.

PREREQUISITES AND COREQUISITES

NA



REQUIRED TEXTS AND ANCILLARY MATERIALS

Elements of Chemical Reaction Engineering, Fourth Edition, H. Scott Fogler, Prentice.

TECHNOLOGY REQUIREMENTS

Software - Excel, Matlab or Polymath

UNIVERSITY POLICIES

The University is an equal opportunity educational institution. Please read [The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.](#))

Academic Accommodations

The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the [Student Disability Services Office.](#)

ACADEMIC POLICIES

The rules of academic dishonesty as described in the University of Toledo General Catalogue will apply to this course. If you are found cheating on an examination, you can be assigned an F in the course. If you are unsure about what constitutes academic dishonesty, consult me.

COURSE EXPECTATIONS

While homework assignments are not mandatory for this course, suggested problems will be assigned and solutions posted on blackboard. All exams missed without prior notice cannot be made up and will be considered a zero. Exceptions will be made for emergencies to be discussed with the professor.

GRADING

Grading:

Exam 1	25 %
Exam 2	30 %
Final exam	35 %
Homework	10%

Grade Scale:	90-100	A
	80-89	B
	70-79	C
	60-69	D
	Below 60	F