

## **CENG 3230 Chemical and Biological Reaction Engineering**

Lecturer: Dr. King Lun Yeung (Room 4550)  
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Teaching Asst: Mr. Rans Lintag                      Mr. Zhouying Jia  
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Objectives: (1) Understand the basic principle of reaction and reactor engineering.  
(2) Develop skills in the design and analysis of different reactor units.  
(3) Ability to make informed decision on proper reactor selection.  
(4) Develop problem-solving skills.

Textbook:

H. Scott Fogler, Elements of Chemical Reaction Engineering, Pearson, NJ (2006).

References:

L. D. Schmidt, The Engineering of Chemical Reactions, Oxford University Press, NY (2005).

Grade Assessment:

Class Attendance/Work	10 %
Assignments	30 %
Midterm Examination	30 %
Final Examination	30 %

Class Attendance: 10%

*(Objectives: To encourage student class participation and to develop an interactive learning environment)*

- Exercises will be solved in the class with student participation to better illustrate the basic chemical and biological reaction engineering principles.

Assignments: 30%

*(Objectives: To develop problem solving skills and provides a continuous assessment of students' progress in the course. Encourage the use of computation tools for solving chemical reaction and reactor problems.)*

- Assignments (5) will be given on Thursday and due two weeks later (6:00 pm latest). There would be three problems each including one requiring the use computational calculation.

Examinations: 60%

*(Objectives: To assess the students understanding of the course materials)*

Midterm and Final examination will be given during the semester. Each exam will be for 3 h and will be held on Saturday mornings.

Consultation Hours: *Dr. King Lun Yeung (Rm. 4550)*

Wednesday 16:00 - 18:00, Or by appointment

## Lecture Outlines

(Three 1.5 h Lecture and one 1 h tutorial)

Week	Topics
1	Introduction, Reactions and Reactors
2	Conversion and Reactor Sizing
3-4	Rate Laws and Stoichiometry
5	Collection and Analysis of Data
6	<u>Midterm Examination</u>
6-7	Isothermal Reactor Design -1
8	Isothermal Reactor Design -2
9	Introduction to New Reactor Systems
10-11	Bioreactions and Bioreactors
12-13	Catalysis and Catalytic Reactors
14	Review
15	<u>Final Examination</u>