CHBE 4320 Syllabus

Reactor Design, Section A, 2 credit hours

Fall 2026

Instructor Information

Instructor: Yonathan Thio

General Course Information

Description

The basic principles of reactor design are introduced, including material and energy balances for homogeneous and heterogeneous systems

Course Learning Outcomes

By the end of this course, a student should be able to:

1) Develop and solve material and energy balances for various reactor types
2) Determine reaction kinetics by analyzing data from a variety of reactor types
3) Model and design ideal isothermal reactors and combinations thereof for homogeneous, heterogeneous, and biochemical reactions
4) Model and design non-isothermal reactors by accounting for the heat effects
5) Analyze residence time distribution (RTD) data to identify non-idealities in reactor configurations and utilize this information to predict reactor performance
6) Analyze reaction/diffusion behavior in heterogeneous catalysts and the impact on reactor design

Required Course Materials

Elements of Chemical Reaction Engineering, H. S. Fogler, 6th ed., Prentice Hall, 2021; Chemical Engineering Kinetics and Reactor Design, C. H. Hill and T. W. Root, 2nd ed., John Wiley & Sons, 2014.

Grading Policy:

In this course the following graded assessments and assignments are used to determine the course grade:

Homework	10%
Quizzes	10%
Midterm Exams	40%
Project	10%
Final Exam	30%

The letter grade cutoffs in this class are 90%+ for A, 80%+ for B, 70%+ for C, 60%+ for D, based on the overall score based on the relative weights above. These cutoff points may be lowered (resulting in a higher grade for some students) but will never be increased.

Course Policies

Attendance and/or Participation

Your academic success will depend strongly on the level of engagement with the course material. Actively participating in all lectures and taking advantage of other learning opportunities offered (e.g. assignments, office hours) is critical for successful attainment of the learning outcomes. The Georgia Tech Catalog describes policies around "approved Institute activities" (e.g., field trips and athletic events) and accommodations around religious observances.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Cases of suspected cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Core IMPACTS

Not applicable for this course.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.