CHBE 3300 Syllabus

Chemical Kinetics and Catalysis, 2 credit hours

Summer 2026

Instructor Information

Instructor: Carsten Sievers

General Course Information

Description

The basic principles of chemical reaction kinetics, including rate laws, mechanisms, and heterogeneous catalysis are introduced.

Course Learning Outcomes

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

1) Understand chemical reactions using microscopic theories and molecular modeling.
2) Analyze reaction mechanisms for homogeneous, heterogeneous, and biochemical reactions and develop suitable kinetic rate expressions.
3) Analytically and numerically determine reaction rate laws using data from batch reactors.
4) Analytically and numerically model batch reactor behavior for single and multiple reactions.

Required Course Materials

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:

Quizzes on Homework	20%[1]
Midterm Exam	25%
Numerical methods assignments	20%
Final Exam	35%

[1] The lowest score will be dropped.

The letter grade cutoffs in this class are 87%+ for A, 74%+ for B, 61%+ for C, 48%+ 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.