CHBE 4411 Syllabus

Process Dynamics and Control, Section A, 3 credit hours

Fall 2026

Instructor Information

Instructor: Joseph Scott

General Course Information

Description

Dynamics of chemical processes and their control. Techniques of conventional process control as well as digital control.

Course Learning Outcomes

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

1) Understand and discuss the importance of process control in process operation and the role of process control engineers.
2) Understand and design the modern hardware and instrumentation needed to implement process control.
3) Develop mathematical models of chemical and biological processes by writing unsteady- state mass and energy balances.
4) Recognize and fit various simple empirical models that are used for designing controllers.
5) Analyze linear dynamical systems using matrix algebra and Laplace transforms.
6) Design and tune feedback controllers.
7) Analyze stability and performance of feedback loops using Laplace and frequency domain techniques.

Required Course Materials

Seborg, Edgar, Mellichamp, and Doyle, Process Dynamics and Control, 4th edition, Wiley, 2016.

Grading Policy:

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

Homework	20%
Midterm Exam 1	25%
Midterm Exam 2	25%
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.