

CHBE 6779 Syllabus

Bioprocess Engineering, Section A, 3 credit hours, Fall 2026

Instructor Information

Instructor: Lily S. Cheung

General Course Information

Description

Integrating several ChBE core concepts, bioprocess engineering applies the engineering principles to biological systems. Topics covered include enzyme kinetics, fermentation, downstream processing, and integrated bioprocesses important to biotech industries.

Course Learning Outcomes

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

1. Use correct biological terms to describe and analyze phenomena in bioprocesses.
2. Model enzyme kinetics and the impacts of inhibition and limiting conditions.
3. Analyze mass transfer limitations in immobilized enzymes and cell systems.
4. Model cell growth dynamics, substrate consumption, and product formation.
5. Select appropriate bioreactors and design and scale up bioreactor operations.
6. Evaluate molecular biology tools to construct recombinant cell lines.
7. Design downstream separation and purification strategies for bioproducts.
8. Identify biohazards and implement bioprocess safety and risk mitigation strategies.

Required Course Materials

Bioprocessing Engineering, Basic Concepts (2nd edition), Shuler, Kargi and DeLisa, 2017.

Grading Policy:

The following graded assessments are used to determine the course grade:

Quizzes	10%
Class participation	7%
Midterm exam I	18%
Midterm exam II	22%
Project report I	13%
Project report II	17%
Project presentation	9%
Peer project evaluation	4%

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, relative to the weights above. These cutoff points may be lowered (resulting in a higher grade for some students) but will never be increased.

Description of Graded Components:

Quizzes: Short quizzes will take place at the beginning of class time on most Mondays. They will cover the assigned reading (even if the material is not explicitly covered during lectures) and lecture notes covered since the latest quiz. Quizzes are closed-book, closed-notes. No make-up quizzes will be provided for missed quizzes. Your lowest quiz grade will be dropped at the end of the semester. Two additional low quiz grades will be dropped at the end of the semester if CLOS response rates surpass 80%.

Class participation: One point (equivalent to 1% of the course's overall grade) will be awarded for participating in class discussion. Check your participation grade on Canvas weekly to ensure you receive credit for your work. Inquiries at the end of the semester will not be honored.

Exams: Midterm exams will take place during lecture time. You may use your textbooks and any materials from this semester's class posted on Canvas (lecture notes and practice exam solutions). You may also use a programmable calculator; other electronic devices will not be permitted during exams, and students are expected to print all materials they want to bring to exams. Use of all other external resources (including the internet, other textbooks, and communication with other people) to solve exam questions is prohibited. Exams will be cumulative.

Make-up exams: They will only be given in case of pre-approved absences for official institute activities (letter from Registrar's Office required) or other certified excuses (medical, family matters, etc.). Dean of Students approval is required. A student who needs to miss an exam must contact the instructor the day before the start of the exam via email; after-the-fact notifications will result in an automatic zero regardless of the nature of the excuse.

Regrades: Requests for regrading of exams must be made on Gradescope within 7 days of receiving the evaluation back. The entire exam will be regraded.

Project: The project will consist of two progress reports due over the semester and a presentation at the end. The project will be done in pairs. No reports will be accepted after the due date.

Course Policies

Attendance and/or Participation

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

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act in accordance with 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, which 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 schedule an appointment to discuss your needs and obtain an accommodations letter. Please also email me during the first week of class to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe it is important to foster an atmosphere of mutual respect, acknowledgment, and responsibility between faculty members and the student body. [The Student-Faculty Expectations](#) outline basic expectations 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 and to reach out if you think there is anything I can do to improve your learning experience.