Cellular Engineering

Course Information

Instructor: Cheng Zhu (cheng.zhu@gatech.edu)
Course Prefix and Number: BMED 6782 ZHU
Term: Fall 2026

Course Description

This course teaches graduate students two things: 1) How to learn directly from literature (as opposed to textbook), how to evaluate papers (as reviewer), and how to promote and respond to reviewers of your own papers by intense reading and discussion between the students and the instructor and among the students themselves. 2) How to consider cellular phenomena using physiochemical and engineering frameworks by reading a combination of seminal papers and most recent advances in cellular engineering.

Course Learning Outcomes

By enrolling in this course, students will achieve the following specific learning objectives:

1. Learn about molecular mechanisms of specificity (enzymes and receptor–ligand interactions).
2. Learn key concepts and applications of genomic editing, gene circuits, and synthetic biology.
3. Learn basics of stem cells, developmental biology, and mechanobiology at the cellular level.
4. Learn mechanical/chemical principles for analysis of cell adhesion.
5. Learn the latest research frontiers on molecular biomechanics and mechanobiology.
6. Learn the latest research frontiers on cell mechanics and cell motility.

Required Course Materials

There is no formal textbook. The teaching materials are drawn from original technical papers. Review papers and online videos are also provided for background of specific topics.

Grading Policy

This course is graded on a **Satisfactory (S) / Unsatisfactory (U)** basis.

- This course will provide letter grades.
- 40% Exams (20% each), 30% Homework, 30% Class participation.

Attendance Policy

This course includes two scheduled class meetings per week. Students are expected to attend classes and participate in class discussions.

Academic and Research Honesty/Integrity Statement

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 the Student Code of Conduct and the Academic Honor Code, especially Appendix A: Graduate Addendum to the Academic Honor Code.

Allegations of scientific or scholarly misconduct are handled in accordance with the procedures outlined by the Policy for Responding to Allegations of Scientific or Other Scholarly Misconduct.

Core IMPACTS

Not applicable

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services 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.