

## **CHBE 4803/8803 AA Syllabus**

Engineering Next-Generation Medical Devices, Section AA, 3 credit hours

Fall 2026

### **Instructor Information**

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**Instructor:** Alex Abramson

### **General Course Information**

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#### **Description**

Engineering principles and tools are introduced that provide best practices for choosing the most valuable medical problems to tackle how to engineer medical devices to solve those problems. The course culminates with debates on the validity of different Med-Tech start-up company business propositions.

#### **Course Learning Outcomes**

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

1. Provide an overview of emerging medical device technologies, with a focus on wearable, ingestible, and implantable bioelectronic sensors and drug delivery systems.
2. Describe how emerging medical device technologies utilize core engineering concepts to improve health outcomes.
3. Use computational tools, such as artificial intelligence, COMSOL, and Computer Aided Design to inform engineering decisions.
4. Generate questions that can be used to critically assess the commercialization potential of medical devices by evaluating manufacturability, patent protection, clinical value, safety, and other key components.
5. Describe the Design Thinking Process and how it can be used to generate new ideas for medical devices.
6. Demonstrate how to utilize Health Decision Analysis tools to measure how medical devices improve the quality of life for patients and the value that can be realized from this improvement.
7. Enable students to think critically about scientific papers on medical devices and debate the flaws in engineering designs.

#### **Required Course Materials**

None, but a computer will be required during class to look up and read scientific articles.

### **Differences Between 4000- and 8000- level classes:**

Graduate students will have an additional homework problem on certain assignments. Furthermore, graduate students will be assigned as team leaders to each of the debate groups, and they will be expected to organize the arguments for the debates. Two weeks before the debate, graduate students will be required to turn in a 1-page written document outlining their presentation and arguments for their debate.

### **Grading Policy:**

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

Homework	30%
Class Participation	15%
Midterm	20%
Debate (Pro)	20%
Debate (Con)	15%

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**

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### **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.