Interdisciplinary Capstone Design

Course Information

Instructor: Amit Jariwala (amit.jariwala@gatech.edu)
Course Prefix and Number: ME 4723 A/A01
Term: Fall 2026

Course Description

Seniors will work in teams to apply a systematic design process to real multi-disciplinary problems. Problems selected from a broad spectrum of interest areas, including biomedical, environmental, mechanical, industrial design, electrical, and thermal/fluids. Projects must be based on the knowledge and skills acquired in earlier coursework and incorporate appropriate engineering standards and multiple realistic constraints. Emphasis is placed on the design process, the technical aspects of the design, and on reducing the proposed design to practice.

Course Learning Outcomes

Outcome 1: To enable students to synthesize the knowledge and skills acquired in their undergraduate curriculum, in the context of a realistic design project.

1.1 Students will be able to identify relevant topics from earlier courses and then apply them to their design project.

1.2 Students will be able to critically evaluate designs using engineering criteria and predictive usage.

Outcome 2: To develop in students the ability to address a broad range of requirements, including most of the following: performance, economic, marketing, environmental, sustainable, manufacturing, ethical, safety, social, and regulatory.

2.1 Students will demonstrate an ability to identify and specify design requirements from general problem descriptions within the applicable realistic constraints.

2.2 Students will be able to systematically develop a design from the problem statement to a detailed, proof-of-concept design meeting all of the specifications.

Outcome 3: To prepare for the professional design environment, through teamwork and by enhancing students' communication abilities.

3.1 Students will be able to clearly communicate design ideas and information.

3.2 Students will be able to work collaboratively and responsibly as a team.

3.3 Students will demonstrate the ability to facilitate their learning by identifying design issues and questions that require additional investigation beyond their basic undergraduate curriculum knowledge, then formulating appropriate courses of action.

Required Course Materials

All required materials are available to students free of charge through the Canvas LMS.

Grading Policy

This course is graded on a letter grade basis.

1. Team component of grade (75%)
    a. Weekly lab team meetings, weekly deliverables (5%)
    b. Studio-level assignments like Team Charter, Expo Teaser Video, and Expo Participation (5%)
    c. Oral presentations and written reports (65%)
2. Individual Component of Grade* (25%)
    a. Peer evaluations
    b. Individual participation during weekly meetings and progress presentations
    c. Individual attendance, quizzes, and participation during studio meetings

* All team members MAY not receive the same grade.

In general, you are being graded on how you bring your knowledge as a graduating engineer to bear on a "real-world" design problem. The best way to approach the project is to consider yourself either as part of a research and development group and/or an entrepreneur working on a new design. The deliverable is a report (with an associated presentation and poster) in which you must justify the correctness of your recommendations and the proof of concept for the final design to your client. The faculty will be looking for well-worked-out (i.e., quantified) solutions. Faculty will place an emphasis on quantitative analyses that show that you are qualified to work as an engineer after graduation.

An A-level final report meets two basic criteria*:* 1) a third party (e.g., another student or engineer) should be able to manufacture the design from the information present in your report, and 2) your report should provide proof and confidence that the design will work as you describe and expect it to.

Attendance Policy

Students will work in teams to complete the course projects. Studios will reinforce engineering design concepts from earlier classes and discuss topics relevant to the course project. Students are strongly encouraged to attend and participate in all scheduled studios.

Students will meet as a team with the instructor during the supervised lab times. Attendance and active participation at these supervised lab meetings are mandatory.

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.

Students are expected to perform research in an ethical and responsible manner.

Any student suspected of cheating or plagiarizing 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.

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.

Student-Faculty Expectations

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 articulates some basic expectations that you can have of me and that I have of you. Additional information for research-related work is given in The Expectations of Advisors and Advisees. 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.

Campus Resources

Review this website for details about the various makerspaces available on campus: https://coe.gatech.edu/academics/makerspaces.