Capstone Design

Last Updated: Tue, 11/18/2025

Course prefix: ME

Course number: 4182

Section: A

CRN (you may add up to five):
27114 27241

Instructor First Name: Amit

Instructor Last Name: Jariwala

Semester: Spring

Academic year: 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 free to students through the Canvas LMS and online course websites (mecapstone.gatech.edu)

References:

- Eugene A. Avallone, Theodore Baumeister, and Ali M. Sadegh, Marks' Standard Handbook for Mechanical Engineers, 11th Edition, McGraw-Hill, 2007.
- Karl T. Ulrich and Steven D. Eppinger, Product Design and Development, 5th Edition, McGraw-Hill, 2011.
- Harold Rothbart and Thomas H. Brown, Mechanical Design Handbook, 2nd Edition, McGraw-Hill, 2006.
- Richard G. Budynas and J. Keith Nisbett, Shigley's Mechanical Engineering Design, 9th Edition, McGraw-Hill, 2011.
- George E. Dieter and Linda C. Schmidt, Engineering Design. A Materials and Processing Approach, 5th Edition, McGraw-Hill, 2012.
- ME 4315 Energy Systems Analysis and Design references.

Grading policy:

The final grade will be assigned as a letter grade according to the following scale:

- A 90-100%
- B 80-89%
- C 70-79%
- D 60-69%
- F 0-59%

- Team component of grade (75%)
    - Weekly lab team meetings, weekly deliverables (5%)

    - Studio-level assignments like Team Charter, Expo Teaser Video, and Expo Participation (5%)
    - Oral presentations and written reports (65%)
- Individual Component of Grade* (25%)
    - Peer evaluations
    - Individual participation during weekly meetings and progress presentations
    - Individual attendance, quizzes, and participation during studio meetings

* All team members MAY not receive the same grade.

Attendance policy:

Attendance is required for the studio discussions and lab meetings with the faculty advisor.

Academic honesty/integrity statement:

Students are expected to maintain the highest standards of academic integrity. All work submitted must be original and properly cited. Plagiarism, cheating, or any form of academic dishonesty will result in immediate consequences as outlined in the university's academic integrity policy.