Course Syllabus

Edit

ME2110 - Creative Decisions & Design

Location

Lecture	9:30am - 10:45am Mondays and Wednesdays MRDC 2101 - **IDEA Lab** (adjacent to Flowers Invention Studio)
Lab	12:30pm-4:45pm Tuesdays MRDC 2101 - **IDEA Lab** (adjacent to Flowers Invention Studio)

Instructional Team

Marty Jacobson marty@gatech.edu (mailto:marty@gatech.edu)	Lecturer
Dr. Jill Fennell jill.fennell@me.gatech.edu (mailto:jill.fennell@me.gatech.edu)	Lecturer
Lena Moller lmoller3@gatech.edu (mailto:lmoller3@gatech.edu)	Studio Instructor
TBA	Head TA
TBA	Laboratory Supervising Grader (LSG)
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Exams

There are no exams in this course.
A final design review and competition are held on July 15th, and a final paper is due on July 22nd.

This class CANNOT be dropped.

Textbook (Optional):

W. Singhose, J. Donnell, **Introductory Mechanical Design Tools (http://www.lulu.com/shop/jeff-donnell-and-william-singhose/introductory-mechanical-design-%20tools/paperback/product-1y259jp.html)**

Course Objectives

ME2110 provides students the opportunity to practice the following engineering design and technical communication competencies.

Design Learning Objectives

By the end of this course, students will be able to:

1. Frame engineering problems using **customer needs** and **functional requirements**.
2. **Generate potential solutions** and **evaluate them** against defined requirements.
3. **Prototype** intentionally to test hypotheses and reduce design risk (**verification**).
4. **Validate** design solutions in the context of an ill-structured problem.
5. Integrate mechanical, electrical, and control subsystems into **autonomous robotic systems**.
6. Apply **root-cause analysis** to diagnose and resolve failures.
7. Work **effectively in teams** to manage and deliver a complex project.

Technical Communication Learning Objectives

By the end of this course, students will be able to:

A. Justify design decisions under uncertainty **by clearly communicating assumptions, knowns and unknowns, and using appropriate forms of evidence available at the current stage of the design process.**
B. Communicate design tradeoffs **among constraints, risks, and competing performance criteria, using relevant evidence and reasoning to explain why one option is preferable in context.**
C. Design communication for specific audiences**, structuring engineering information so stakeholders can efficiently use it for decisions, implementation, or further development.**
D. Use communication as part of the design process**, recognizing that sketches, specifications, visuals, and reports function as engineering tools that shape decisions.**
E. Use communication to support collaborative engineering work**, building shared understanding, coordinating decisions, and maintaining alignment within design teams.**

Grading

Item	Responsibility	Weight
Teamwork Contribution & Professionalism	Individual	10%
Pre-class Discussions (Perusall)	Individual	10%
Major Project		
Individual Design Concept Video	Individual	15%
Team Charter	Team	5%
Engineering Design Specifications Presentation	Team	5%
Engineering Design Specifications Report	Team	10%
Prototyping Process & Testing Log (Through Sprint 1)	Team	5%
Sprint 1 Stand-Up	Team	5%
Prototyping Process & Testing Log (Through Sprint 2)	Team	10%
Engineering Drawings	Individual	5%
Final Machine Performance	Team	5%
Design Review	Team	5%
Final Report	Team	10%
Completion Requirements		
Safety Training and IDEA Lab User Agreement	Individual	P/F*
Mechatronics Task Completion	Team	P/F*
Fabrication Task Completion	Individual	P/F*
Participate in Design Review / Final Competition	Individual	P/F*
TOTAL	**Individual**	**40%**
	Team	**60%**

*Pass/Fail items not Passed will result in up to 1 full letter grade reduction in final course grade.

Course Delivery

Lectures will meet synchronously in person at the above time, unless otherwise specified.

The course will utilize Canvas and Perusall for posting of lecture material, assignment descriptions, and other details regarding the course.

Studio sections will meet synchronously in person at the IDEA Lab (MRDC 2101). All assignments will be turned in to your studio section's Canvas site.

Technology Requirements

You must have SolidWorks 2025 installed or access to it via GT's VLab.

In this course, we will also be utilizing Inkscape, Trotec JobControl, Cura, and Arduino IDE. These may be useful for you to have on your personal laptops if possible but will also be available in the IDEA Lab and on VLab.

In order to use SolidWorks efficiently, you should own a mouse with a clickable scroll wheel.

Design Review and Final Competition

The design review is a live event where your team will present their robot designs to a judging team to evaluate your team's design in multiple categories. This will also involve a competition-style event of team robots.

Reports, Presentations, and Homework Assignments

Late work is not accepted unless excused or an exception has been arranged with the studio instructor ahead of the due date.

All assignments must adhere to the formatting requirements listed on the assignment submission page in order to be accepted.

Each contributing team member receives the same grade for team assignments.

Students who do not contribute significantly to a team deliverable may not receive credit for that deliverable, with no make-up possible.

When doing work on team assignments, all team members are equally responsible for the quality **and intellectual originality** of the entire assignment. In the event of an Honor Code violation involving a team assignment, all team members will be referred to the Office of Student Integrity for resolution.

Class Participation, Peer Evaluations, and Studio Preparedness

Class participation grades will be based on instructor and TA evaluations of your participation in studio.

Peer evaluation grades will be assessed based on your relative performance on your teams as measured using 3 to 4 structured peer evaluations over the course of the semester.

Lab Stewardship:

Safe lab practices and respect for the open studio space is of critical importance to maintaining a safe working environment for all students and employees. It is also the hallmark of operational excellence in a professional shop environment. Violations of safe lab practices as explained during IDEA lab training including, but not limited to, tool misuse, lack of shop cleanliness, and failure to follow laboratory guidelines, will be noted. Students also must follow the GT Student Code of Conduct (**https://policylibrary.gatech.edu/student-life/student-code-conduct (https://policylibrary.gatech.edu/student-life/student-code-conduct)**). Each violation will nominally count as a 1% demerit on the final grade; however, this may be modified based on severity of the offense. Students may earn back credit lost for IDEA lab violations by participating in positive lab stewardship activities (e.g., shop cleaning tasks, shop improvement activities). Students can consult the lead TAs or TA on duty for these positive lab stewardship activities.

Attendance Policy

You are required to attend **all lectures and all studio sessions.**

Once distributed, Safety Kits must be presented in order for students to be counted as Present. This is to ensure that all students have access to PPE required for working in the IDEA lab as required for most course assignments.

Missing studios will result in a final grade penalty where 1 missed studio equates to 1 letter grade reduction. If you arrive late to lecture or studio, you will be noted as tardy. Two tardy marks equate to one absence. Furthermore, there will be several short in-lecture quizzes. The quizzes may occur at the beginning of lecture, so do not be late. There are no make-ups for these quizzes. If you are more than 15 minutes late for studio, then you are considered absent. All students are expected to attend and participate in the Final Competition, which will be held during studio on Tuesday, July 15, 2025.

In the case of a personal emergency or Institute-approved absence, please consult the information on the Division of Student Life website (**http://studentlife.gatech.edu/content/class-attendance (http://studentlife.gatech.edu/content/class-attendance)**) and follow the appropriate steps. The Dean of Students Office will make the decision and contact your professors stating what (if any) accommodations will be provided. Please notify your studio instructor and TA immediately for coordination purposes if you will not be able to attend lecture or studio due to any illness.

Code of Conduct: Students in this class are expected to abide by the Georgia Tech Honor Code (https://osi.gatech.edu/students/honor-code) and avoid any instances of academic misconduct, including but not limited to i) possessing, using, or exchanging improperly acquired written or verbal information in the preparation of an assignment; ii) substitution of material that is wholly or substantially identical to that created or published by another without adequate credit notations; and iii) false claims of performance or work that has been submitted by the claimant.

In the event of an honor code violation, all team members may be responsible for issues with team deliverables.

Teams should be aware that it is an honor code violation to put a team member's name on a deliverable to which that individual did not contribute.

Policy on Use of Generative Artificial Intelligence[1]:

This policy seeks to establish instructor expectations for the use of AI tools for assignments and other activities in ME2110. Generative AI tools have become increasingly used throughout society for a variety of professional, social, and academic practices. Given their rising prevalence, it is critical for students to learn and practice responsible use of AI tools. ME2110 students should use AI tools i) responsibly, ii) with transparency, and iii) document where and how they were used. You are responsible for all assignments and other work you submit. Work submitted should be your own, and any AI tools or assistance used for work in the course should be clearly acknowledged and disclosed (transparency). Any content (text, figures, design concepts, etc.) generated/created by or with the assistance of AI tools should be cited just as it would be when incorporating, quoting, or summarizing any other content, images, etc. that are not your own. Additional guidelines, requirements, and restrictions may be implemented at the discretion of your studio instructor.

[1] This policy has been adapted from 'Requirements for Developing Generative AI Tool Policies in WCP Courses', available at: **https://sites.gatech.edu/bfhandbook/requirements-for-developing-generative-ai-tool-policies-in-wcp-courses (https://sites.gatech.edu/bfhandbook/requirements-for-developing-generative-ai-tool-policies-in-wcp-courses)**

Mental Health & Wellness:

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, depression, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. GT offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know is experiencing any of the issues noted above, consider utilizing the confidential mental health services available on campus. I encourage you to reach out to GT CARE (**www.care.gatech.edu (http://www.care.gatech.edu)** , 404-894-3498) or the Counseling Center (**www.counseling.gatech.edu (http://www.counseling.gatech.edu)** , 404-894-2575) for support. An on-campus counselor or after-hours services are available to assist you.

COVID-19 Lecture and Studio Safety

All users are asked to verify concordance with GT policies regarding identification of illness on a daily basis. If you fall ill during the course of ME2110 with symptoms associated with COVID-19, immediately

notify your instructor and TA for coordination purposes and follow current GT guidelines posted at: https://health.gatech.edu/ (https://health.gatech.edu/) . It is advisable to notify your respective team members as well, in case adjustment of team contributions is needed relative to team-based assignment progress.

Course Summary:

Date	Details	Due
Tue May 13, 2025	Perusall - Individual Subsystem Concepts & Prototype Demonstration (https://gatech.instructure.com/courses/522524/assignments/2429184)	due by 11:59pm
Mon May 19, 2025	Perusall - Giving Presentations Worth Listening To (Video) (https://gatech.instructure.com/courses/522524/assignments/2429178)	due by 11:59pm
	Perusall - How to avoid death By PowerPoint (Video) (https://gatech.instructure.com/courses/522524/assignments/2429180)	due by 11:59pm
Wed May 21, 2025	Individual Customer Discovery Questions	to do: 12am
Tue May 27, 2025	Individual Design Concept - Video (https://gatech.instructure.com/courses/522524/assignments/2429182)	due by 11:59pm
	DELETE - indiv. design concept build (https://gatech.instructure.com/courses/522524/assignments/2429186)	due by 11:59pm
Wed May 28, 2025	Team Formation and Team Charters (https://gatech.instructure.com/courses/522524/assignments/2429216)	due by 11:59pm
Fri May 30, 2025	Fabrication Training Log (Individual) (https://gatech.instructure.com/courses/522524/assignments/2429176)	due by 11:59pm
Mon Jun 2, 2025	Customer Discovery Transcripts (https://gatech.instructure.com/courses/522524/assignments/2429164)	due by 11:59pm

Date	Details	Due
	Mechatronics Training Log (Training Pairs) (https://gatech.instructure.com/courses/522524/assignments/2429188)	due by 11:59pm
Wed Jun 4, 2025	Sprint Logs (Process Documentation for Sprints 1 & 2) (https://gatech.instructure.com/courses/522524/assignments/2429210)	due by 11:59pm
	Team Charter (https://gatech.instructure.com/courses/522524/assignments/2429214)	due by 11:59pm
Tue Jun 10, 2025	Engineering Design Specifications Presentation (https://gatech.instructure.com/courses/522524/assignments/2429170)	due by 11:59pm
Fri Jun 13, 2025	Engineering Design Specifications Report (https://gatech.instructure.com/courses/522524/assignments/2429172)	due by 11:59pm
Mon Jun 16, 2025	Stand-Up Meeting Preparation (https://gatech.instructure.com/courses/522524/assignments/2429212)	due by 11:59pm
Fri Jun 20, 2025	Prototyping Process & Testing Log (Through Sprint 1) (https://gatech.instructure.com/courses/522524/assignments/2429200)	due by 11:59pm
Mon Jun 23, 2025	Peer Evaluation 1 (https://gatech.instructure.com/courses/522524/assignments/2429190)	due by 11:55pm
Tue Jun 24, 2025	Sprint 1 Stand-Up (https://gatech.instructure.com/courses/522524/assignments/2429208)	due by 11:59pm
Mon Jun 30, 2025	Comprehensive Design Report with Executive Summary (https://gatech.instructure.com/courses/522524/assignments/2429162)	due by 11:59pm
Wed Jul 9, 2025	Prototyping Process & Testing Log (Through Sprint 2) (https://gatech.instructure.com/courses/522524/assignments/2429202)	due by 11:59pm
Tue Jul 15, 2025	Design Review (https://gatech.instructure.com/courses/522524/assignments/2429166)	due by 11:59pm

Date	Details	Due
	Design Review/Competition Participation (https://gatech.instructure.com/courses/522524/assignments/2429168)	due by 11:59pm
	Performance: Competition (https://gatech.instructure.com/courses/522524/assignments/2429194)	due by 11:59pm
Tue Jul 22, 2025	Comprehensive Design Report (https://gatech.instructure.com/courses/522524/assignments/2429160)	due by 11:59pm
	Engineering Drawings (https://gatech.instructure.com/courses/522524/assignments/2429174)	due by 11:59pm
Mon Jul 28, 2025	Peer Evaluation 2 (https://gatech.instructure.com/courses/522524/assignments/2429192)	due by 11:55pm
	Roll Call Attendance (https://gatech.instructure.com/courses/522524/assignments/2429204)	
	Safety Training & IDEA Lab User Agreement (https://gatech.instructure.com/courses/522524/assignments/2429206)	
	Teamwork Contribution & Professionalism (https://gatech.instructure.com/courses/522524/assignments/2429218)	