ME2110 course details

- **Lecture**
  - Asynchronous recorded
  - [http://2110.me.gatech.edu](http://2110.me.gatech.edu)

- **Studio Instructors:**
  - Ms. Kristi Mehaffey, A1
  - Dr. Levent Degertekin, A2/A3
  - Dr. Richard Simmons, A4
  - Dr. Richard Cowan, A5/A9
  - Dr. William Singhose, A6
  - Dr. Alexis Noel, A7
  - Dr. Kyriaki Kalaitzidou, A8/A11
  - Dr. Euisun Kim, A10

- **Studio**
  - Website: Canvas
  - Synchronous, 2h 45m long
  - Various timings by section
  - Hybrid online/in-person
  - Online: teleconferencing (Bluejeans or MS Teams)
  - In-person: IDEA Laboratory (MRDC2101)

- **Head TAs:**
  - Jesse Goodwin
  - Carrie Li

- **Studio TAs:**
  - Jacob Bultman
  - Michael Carrillo
  - Dylan Hebert
  - Sanjana Kumar
  - Zachary Towner
  - Ritesh Bhatt
  - Tara Chan
  - Lauren Heinrich
  - Jenny Wang
Course Objectives

To learn:

• fundamental procedures for solving engineering design problems
• the essential details of analyzing, synthesizing, and implementing design solutions with flexibility, adaptability, and creativity
• the techniques which allow an engineer to tackle new, unsolved, open-ended problems
• by doing through team and individual projects and assignments
Characteristics of Design

- Multi-stage - hierarchical decomposition
- Large quantities of data - modularized
- Support design tools - analysis, optimization, simulation, etc. - in various design phases
- Uncertain design path
- Alternatives, revisions, versions
- Iterative and cyclic
- Teamwork - interactions between designers
- Multidisciplinary
- Dynamic
ME2110: Creative Decisions and Design

This course is about:

• understanding alternatives
• problem solving
• organization
• writing
• presenting
• fabrication

Professionalism

• projects
• reports
• attendance
Suggestions for this course

Do
• be in class on time
• be in studio on time
• pay attention
• use the tools that are presented
• give professional presentations
• act professionally
• follow procedures (safety)
• clean-up in studio
• report damaged equipment
• have fun

Don’t
• miss class
• turn in hand written reports
• turn in unprofessional reports
• close your minds to the alternatives
• bring food into studio
• leave a mess in studio
<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Studio Preparedness</td>
<td>10%</td>
</tr>
<tr>
<td>Lab Stewardship</td>
<td>5%</td>
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<tr>
<td>First Studio Report</td>
<td>5%</td>
</tr>
<tr>
<td>Introductory Project/Presentation</td>
<td>10%</td>
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<tr>
<td>Major Project</td>
<td>50%</td>
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<tr>
<td>Design Report/Presentation</td>
<td>10%</td>
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<tr>
<td>Sprint 1 Report/Presentation</td>
<td>10%</td>
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<tr>
<td>Sprint 2 Report/Presentation</td>
<td>10%</td>
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<tr>
<td>Final Report/Presentation</td>
<td>15%</td>
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<tr>
<td>Design Review</td>
<td>5%</td>
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<tr>
<td>Safety Briefing and IDEA User Agreement</td>
<td>P/F</td>
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<tr>
<td>Give at Least One Oral Presentation</td>
<td>P/F</td>
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<tr>
<td>Mechatronics and Fabrication Training</td>
<td>P/F</td>
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<tr>
<td>Participate in Design Review/Final Competition</td>
<td>P/F</td>
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Attendance

You must attend all studios:

- attendance will be taken
- missing a studio results in a 0 for that studio grade
- missing a studio assignment results in a letter grade reduction
- being late (arriving between 15 mins late) is 0.5 of a missing lecture
- missing studios (rounded down) will result in a final grade penalty
  - 1 missed studios = 1 letter grade reduction
  - 2 missed studios = 2 letter grade reduction
  - 3 missed studios = 3 letter grade reduction
  - 4 missed studios = 4 letter grade reduction
Course Materials

Arduino Uno (provided)

Course Text (recommended)

Arduino IDE

Introductory Mechanical Design Tools

William Singhose  Jeff Donnell
COVID-19 guidance

• Modified fabrication assignments and laboratory usage to reduce in-person activities
• Follow daily health checks and reporting guidelines in place by GT
• Maintain physical distancing when in laboratory
• Practice good prevention principles
• Communicate with your group, studio professor and TA
COVID-19 laboratory specifics

- Studio use in W3-W4, W8-14
- Capacity-limited, reservation-required
- Personal protective equipment (PPE)
  - Face masks required
  - Safety glasses required (provided, common)
  - Face shields optional (provided, individual)
- Sanitization protocols
- Temperature checks
- Workstation distancing and barriers
- Aisle markings
Critical Information

Studio sections will be held first week – online at studio timing
Studio professors will contact you with connection information
Do not miss your studio section
Install Solidworks 2020, Inkscape, Arudino IDE
Some Advice

Get to know your TA and instructor
Keep on top of the assignments and reports
Learn your material, it is valuable
Learn to tell your story, this course can help you in the future
You learn more from failure than from success – revisions!
Prototypes lead to ideas and to products
1st Studio Assignment

Christopher Saldana, Ph.D.
Woodruff School of Mechanical Engineering
Georgia Institute of Technology
Atlanta, Georgia USA
Week 2: Virtual Product Dissection

**Goal:** analyze the design and manufacture of 2 household products

**Considerations:** customer needs, requirements, metrics, device functions and mechanisms, risks

**Exercise 1:** Product 1 activity (45 min)

**Exercise 2:** Product 2 activity (45 min)

Due week 3 (studio start): maximum 3-page report
Week 2: Virtual Product Dissection

Team Roles
Moderator / CAD controller / Scribe / Contributor

Accessing Files
Option (1) and (2): Install Solidworks 2020 or use myCloud, download CAD models beforehand on ME2110 website
Option (3): Use Autodesk Fusion 360 web viewer
Written communication tips

Writing
• Logical (technical) not Chronological (creative?)
• Avoid colloquial language, use sophisticated writing!
• No self referencing
• Avoid 1-3 sentence paragraphs
• Ask your instructor for advice

Common formatting rules that tend to be issues
• Justify text, page numbers, sequential figure referencing

Figures/tables
• Not embedded in text, put these on pages after text
• Professional – legibility, resolution
• Figure captions below figures, table captions above tables

See reference book: Chapter 11 to Appendix A
Written communication tips

Explaining design concepts

General organization

• Primary systems and subsystems - mechanisms, operation, construction
• Performance relative to requirements

Clarity in presentation

• Be clear in describing design features. Match words in the body to label text in figures.
• Avoid describing things that are not shown with evidence or detail. Don’t rely on reader’s imagination.