you are part of an experiment to create the most high-profile, rewarding, expensive, hard-working course at Georgia Tech and a model for mechanical design education at engineering schools worldwide

http://mecapstone.gatech.edu/
Fall 2016 ME Capstone Instructors

Aaron Ames  
Ken Cunefare  
Amit Jariwala  
Gregg Larson

Harvey Lipkin  
Todd Sulchek  
Kathryn Wingate
Super Support Staff

Invention Studio

Clint Rinehart

Machine Shop

Steven Sheffield

Scarlett Taylor

Nate Watkins (Finance)

Thomas Spencer (TA)

J.D. Huggins
What is ME 4182 and GT 4823 all about?

Application of the design process to solve an engineering problem which includes interdisciplinary parameters such as human factors, engineering economy, safety, etc. A team structure is used to design a mechanical device or machine that performs the functions established by a project description. Each team produces detailed drawings, detailed specifications, a presentation, and a prototype of the proposed design.

Goals for the course

1. Invent/design something useful CREATIVITY
2. Apply your analytical knowledge to design it ANALYTICAL SKILLS
3. Build it, test it (physically & virtually) HANDS-ON
4. Document everything (lab notebooks, reports, presentations)
5. Demonstrate it at the Design Expo
6. Give to sponsor for use or patent it and start company
Main Lecture Topics

1. Introduction, Teaming, Communication, Projects
2. User needs / Stakeholders / Engineering Design Specifications
3. Ideation, Concept Generation, Design Process
4. Market research and Prior Art
5. Industrial design & Human Factors
6. Social, environmental, sustainability considerations
7. Risk, Liability, Codes & Standards
8. Analysis
9. Making mockup/prototype/mass production
11. Forming a company

Associated deliverables and reports are due in your section meeting during the semester
Section meetings

- ~ 30 min/wk with your team and your instructor
- Your instructor provides weekly mentorship, expects deliverables, grades, etc.
- Students in GT4823:
  - All BMEs need to attend lectures only on Tuesdays from 3-4pm in CoC #16
  - Students from other disciplines in GT4823 need to attend lectures in IC #103 on Tuesdays. It is highly recommended that they also attend the lectures on Thursdays (same time and place)
Timeline

- Today
- 1st report
- 1st presentation
- 2nd report
- 2nd presentation
- Final report
- Final presentation

Choose a team
Choose a topic
Figure out the problem
Market research
Patent study
Design concepts

Design concept
Physical Mockup
Analyses
Calculations
Drawings

Design validation
Prototyping
Testing
CAD
FEA
Manufacturing
GT Fab Facilities: Montgomery Machining Mall

- Hours are Monday through Friday:
  - 7am–5pm now 7am-9pm!

- JD Huggins “office hours” on M: 1:30-4:30 and W: 9-12.

- Need to register for tool training.

20th: CNC mills, lathes, EDM, presses, ...
19th/Dirty: tig/mig welding, grinding, saws...
21st: Zeiss CT scanner...

http://www.me.gatech.edu/facilities/machine_shop
GT Fabrication Facilities: Invention Studio

- Circuit Lounge
- 3D Print Farm
- Water Jet
- Laser Cutters
- Metal working
- Wood shop

Microcontrollers; National Instruments DAQ Boards; Paint Booth; Vinyl Cutting; Urethane Casting and Molding; Vacuum Forming; Injection Molding; 3D Scanning; Spot Welding…

Become a PI!!

2nd Floor MRDC
Staff Contact: Clint Rinehart
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Electronics Fabrication

ME Electronics Lab
MRDC 2nd Floor

Vladimir Bortkevich
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ECE Senior Design Lab
Van Lear

Staff Contact: James Steinberg
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Capstone Design Expo

Tuesday Dec 6, 4-8pm
McCamish Pavilion
Capstone Expo winners will receive automatic berth to the semifinal round competing for the $15k Prize and a Patent.
Summer Startup – Create X
http://mecapstone.gatech.edu/
(grading, schedule, report templates, ... )
Project overview

A variety of projects for teams of 4-6 people:
– Industrial (big and small)
– Research lab
– Developing country/sustainability
– Biomedical
– Your own crazy idea!
Due Dates (NOW!)

• **Saturday, 8/27, midnight** – deadline for submitting bids for sponsored projects on projects.gatech.edu

• For your own idea:
  – Get approval from instructor;
  – Register your team on projects.gatech.edu

• Make sure all team members are listed in your team on projects.gatech.edu
What is a Good Bid?

Basically, convince us that you are the best group for the project.

Tell us:

• Why do you want the project?
• What are your skills, talents, experiences relevant to the project?
• What is your understanding of the project?
• Anything else that is relevant
Elements of a Good Student Project

1. Creative/Innovative - not just an assembly of off-the-shelf parts
2. Lends itself to analysis
3. Produce a prototype and learn from it
   ▪ prototype revisions
   ▪ design changes
4. Sufficient scope for senior design
5. Team should have or acquire the skills to complete the project.