

# ME4182 & Interdisciplinary Capstone Design

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/students>

(for lecture slides, links, etc.)

# What is Capstone Design all about?

## Goals for the course:

**1. Identify an unmet need**

**WHAT'S THE PROBLEM?**

**2. Invent/design something useful**

**CREATIVITY, INNOVATION**

**3. Apply your analytical knowledge to design it**

**ANALYTICAL SKILLS**

**4. Prove it will work (Simulate it, build it, test it, virtually, physically)**

**MODELING AND HANDS-ON**

**5. Document your process (reports, presentations)**

**6. Demonstrate it at the Expo**

**7. Give to sponsor for use or patent it and start company**

# Project Types

1. External company sponsored

2. Faculty Research Lab

3. Your own idea!

- Check out currently available projects (**more are being added**) here: <http://capstone.gatech.edu/marketplace>
  - You will be able to access the site using your GT login credentials
- For guidance on how to use the online portal, see this: <http://capstone.gatech.edu/howto>
- Examples of past projects (from Summer 2020) are here: <http://capstone.gatech.edu/projects/>

# Elements of a Good Student Project

- What's the problem?
  - NOT “We're going to design a better mousetrap”
- Creative/Innovative - not just an assembly of off-the-shelf parts (room for novelty)
- Lends itself to analysis
- Sufficient scope for senior design
- Team should have or acquire the skills to complete the project.
- Produce a proof-of-concept and learn from it
  - Design revisions
  - Validate design decisions

# How to form a team?

- Team sizes are 4-6 students per team.
- Find team members
  - Based on project interest on <https://capstone.gatech.edu/marketplace>, **or**
  - Based on skills and experience on <https://capstone.gatech.edu/marketplace>
  - Self-identified/assembled during lab meeting on 19<sup>th</sup> August.

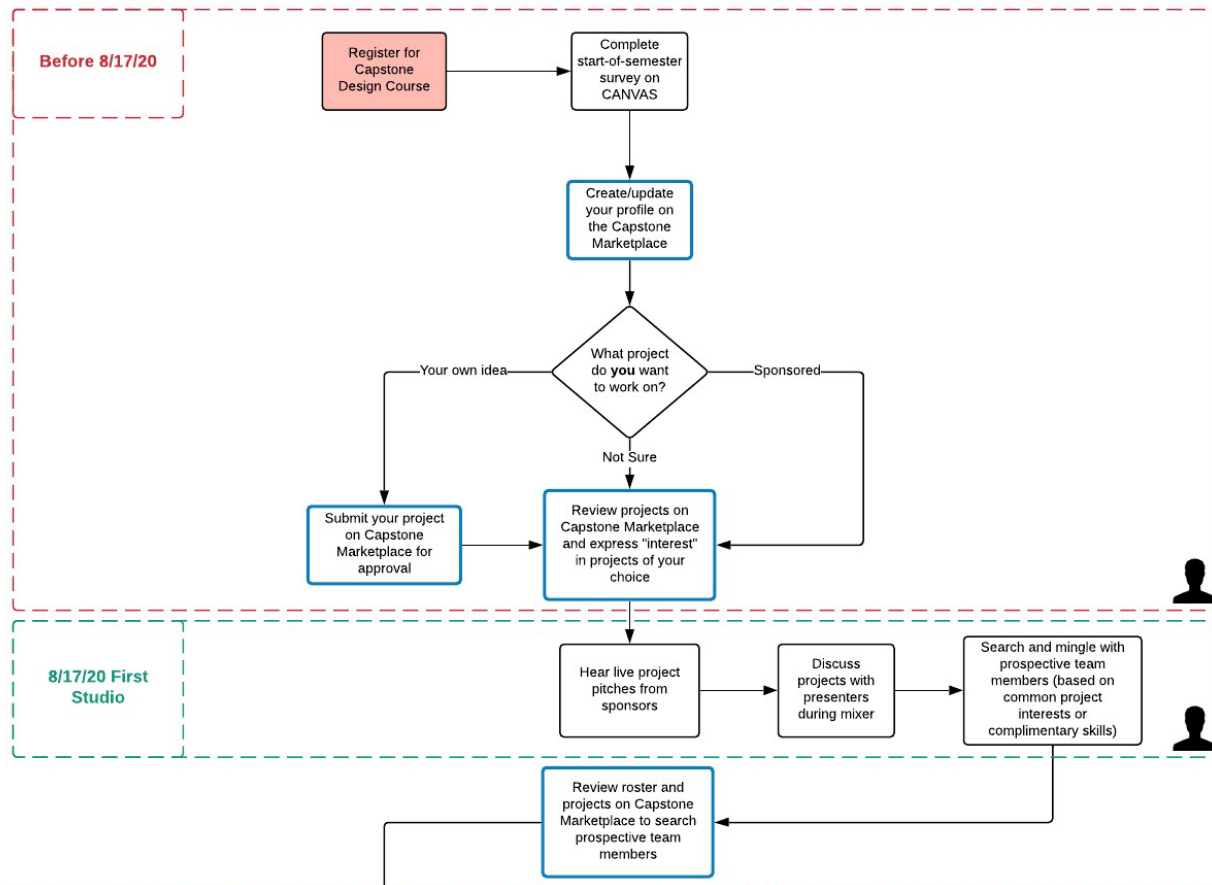
# Interdisciplinary Capstone Design team logistics

- Primary advisor for the ME4723 team is determined based on the majority discipline of the team.
- Primary advisor meets with the entire team on a weekly basis during the scheduled lab session
- Faculty from other schools represented in the ME4723/ECE4873/BMED4873 team serve as secondary advisors.
- Secondary advisors meet with the team on as-needed basis and make sure that the team follows any discipline specific requirements.

# Timeline Flowchart for Week #1: A

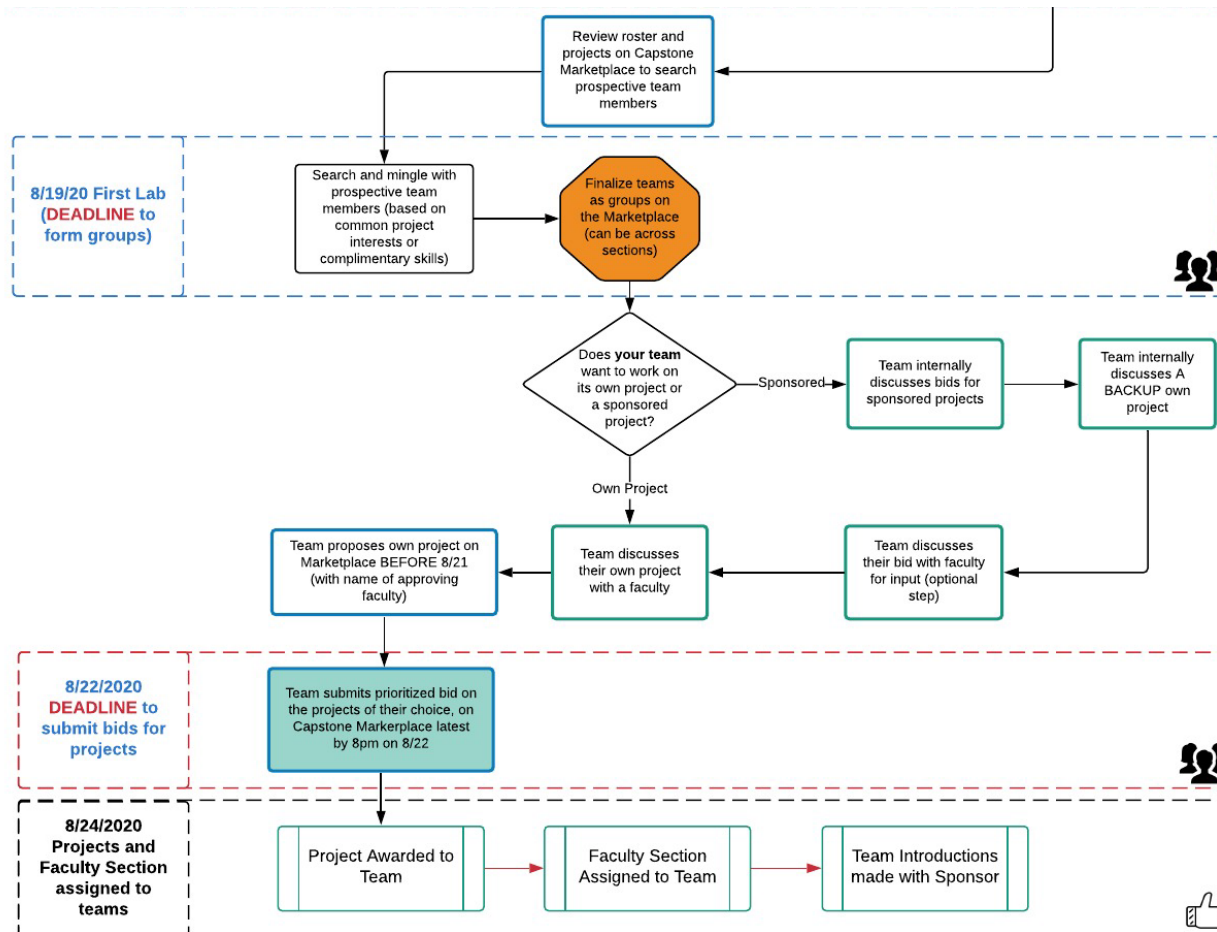
- Check this LINK: [https://app.lucidchart.com/documents/view/4bec40f8-5061-575f-b745-06150a7cefd9/0\\_0](https://app.lucidchart.com/documents/view/4bec40f8-5061-575f-b745-06150a7cefd9/0_0)

## First Week of Classes for Capstone Design



# Timeline Flowchart for Week #1: B

- Check this LINK: [https://app.lucidchart.com/documents/view/4bec40f8-5061-575f-b745-06150a7cefd9/0\\_0](https://app.lucidchart.com/documents/view/4bec40f8-5061-575f-b745-06150a7cefd9/0_0)



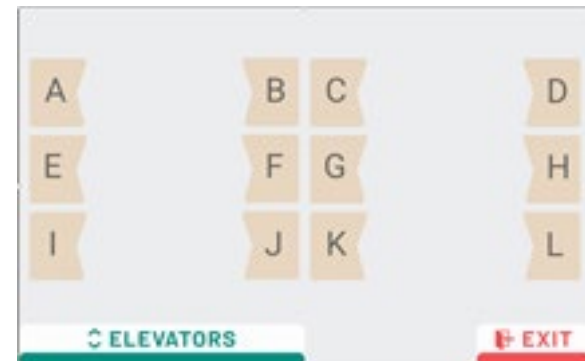


# Important Dates for Students

- Pre-semester activities:
  - Submit start-of-semester survey on CANVAS
  - Create profile on [projects.gatech.edu](https://projects.gatech.edu) and enter skills/experience
  - Soft deadline to propose your own idea for premium pitch opportunity on [capstone.gatech.edu/marketplace](https://capstone.gatech.edu/marketplace)
- 17th August (Project Overview Day)
  - Learn about Industry Sponsored Projects
  - Propose your own idea, if any
- 19th August (Team Finalization Day)
  - 12:30pm: Course Overview
  - 3pm: **DEADLINE** to form Groups on [capstone.gatech.edu/marketplace](https://capstone.gatech.edu/marketplace)
- 21st August
  - 11:59pm: **DEADLINE** to submit your own project idea on [capstone.gatech.edu/marketplace](https://capstone.gatech.edu/marketplace)
- 22nd August at 8pm:
  - **DEADLINE** to submit bids for sponsored projects on [capstone.gatech.edu/marketplace](https://capstone.gatech.edu/marketplace) (*you will be required to work on ANY project that your team bids on if it is assigned*)
- 24th August:
  - 12:00noon: Groups assigned to industry projects and to sections
  - 12:30pm: Scheduled Studio on Bluejeans.com
- 26th August:
  - 12:30pm: Scheduled Lab meeting with your assigned section to present your problem statement

# Plan for Day 1: Studio on 17<sup>th</sup> August

- 12:30pm : Welcome and course overview (joint for ME4182 and Interdisciplinary Capstone Design) on:  
<https://primetime.bluejeans.com/a2m/live-event/ccqwpqyz>
- 12:40pm: Pitches by sponsors (2 minute per project)
- 1:25pm: Switch over to <http://capstoneone.gatherly.io/> platform
- 1:30pm: Designated floors for students to mingle with other students and sponsors. Booths setup on each floor for project presenters
  - Lobby: Welcome area and help desk
  - Floor 1: Industry projects cluster 1 (projects with **E1** prefix)
  - Floor 2: Industry projects cluster 2 (projects with **E2** prefix)
  - Floor 3: Student self-proposed Idea and meet with faculty (projects with **SF** prefix)
  - Floor 4: Entrepreneurial (Create-X) projects' floor
- 2:25pm: Adjourn



Floor layout on Gatherly  
for 17<sup>th</sup> August Session

# Welcome to Capstone Design

## Social Mixer – 17<sup>th</sup> August, 2020

<http://capstoneone.gatherly.io/>

**Sponsors:** Please take elevators to visit your designated floor and then stay at your assigned floor/booth

**Faculty:** Please visit Floor 3 and stay at your assigned booth

**Students:** Feel free to visit the various floors and mingle with sponsors, faculty and fellow students!

Note that the max. number of people in a huddle is **15** and so you will need to wait for someone to leave the huddle to let you in!

### Lobby

1 person

Networking

Social



GO BACK

### Floor 1: Sponsored Projects 1

0 people



JOIN FLOOR

### Floor 2: Sponsored Projects 2

0 people



JOIN FLOOR

### Floor 3: Student Idea/Faculty

0 people



JOIN FLOOR

### Floor 4: Create-X

0 people



JOIN FLOOR

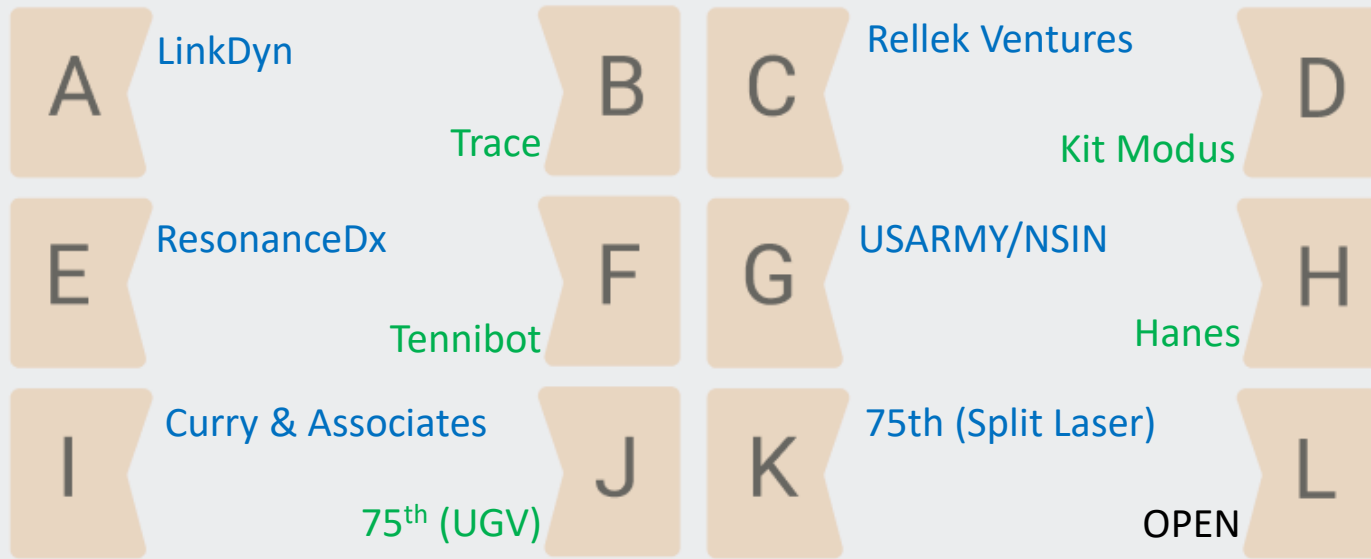
# Floor 1: Sponsored Projects 1



**Floor 1: Sponsored Projects 1**  
 0 people  
 JOIN FLOOR

Project	Company	Project	Company
E1-A: Vial snap cap	Genentech	E1-G: Integrated Spring Orthotic	Steve Schrader (self)
E1-B: HIGH WATER PERFORMANCE ALUMINUM SWING ENTRANCE DOORS	Kawneer Company, Inc. (An Arconic Company)	E1-H: Retrofit, Cantilever CNC Plasma Gantry for FabBlock	Tab and Slot
E1-C: Optimized Pallet Design	Siemens Mobility, Inc	E1-I: Adiabatic Diesel Engine	Prof. (Emeritus) Steve Dickerson
E1-D:	OPEN	E1-J: Sintering Kiln for space (CubeSat Kiln)	Scout Aerospace
E1-E: Design of tensile test apparatus for dry carbon fiber up to 5000 °F	Southern Research	E1-K:	OPEN
E1-F:	PNNL	E1-L:	OPEN

# Floor 2: Sponsored Projects 2



## Floor 2: Sponsored Projects 2

0 people



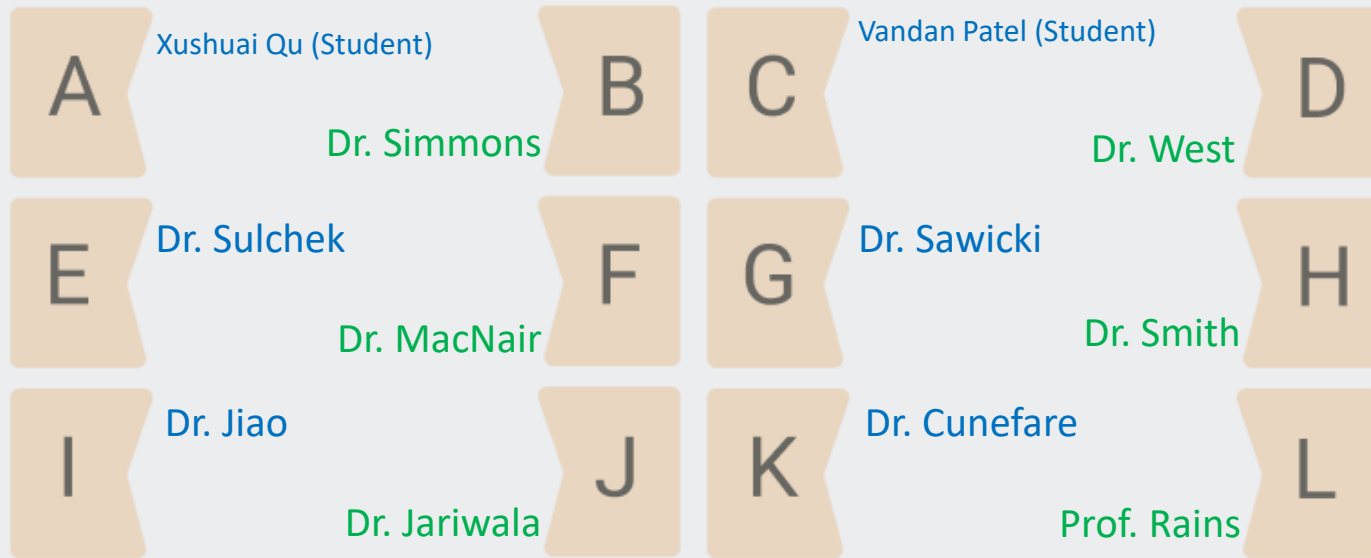
JOIN FLOOR

ELEVATORS

EXIT

Project	Company	Project	Company
E2-A: Design for manufacture/assembly of an autonomous mobile platform	LinkDyn Robotics Inc.	E2-G: MUSCLE STRENGTH DEVICE (MSD)	USARMY
E2-B: Trace Smart Can Hardware	Trace, Inc	E2-H: Champion SmartPatch	Hanes
E2-C(1): Spinal Decompression System	Rellek Ventures	E2-I: Lagoon Depth Measuring Device	Curry & Associates, Inc.
E2-C(2): IOT Enabled Glove for Physical Therapy	Rellek Ventures	E2-J(1): Unmanned Ground Vehicle (UGV) Range Extension	3D Battalion / 75th Ranger Regiment
E2-D: Design of dynamic canvas projection system to simulate artificial reality	Kit Modus	E2-J(2): Unmanned Ground Vehicle (UGV) 360 degree camera	3D Battalion / 75th Ranger Regiment
E2-E: Fluidic Package design optimization for a Covid-19 rapid diagnostic test	ResonanceDx	E2-K: Split laser for US Army Special Operations Rangers' machine guns	3D Battalion / 75th Ranger Regiment
E2-F: Tennibot X	Tennibot	E2-L(1-3): (ME/ID ONLY)	Several*

# Floor 3: Student Idea/Faculty



 **ELEVATORS**

 **EXIT**

**Floor 3: Student Idea/Faculty**

 0 people

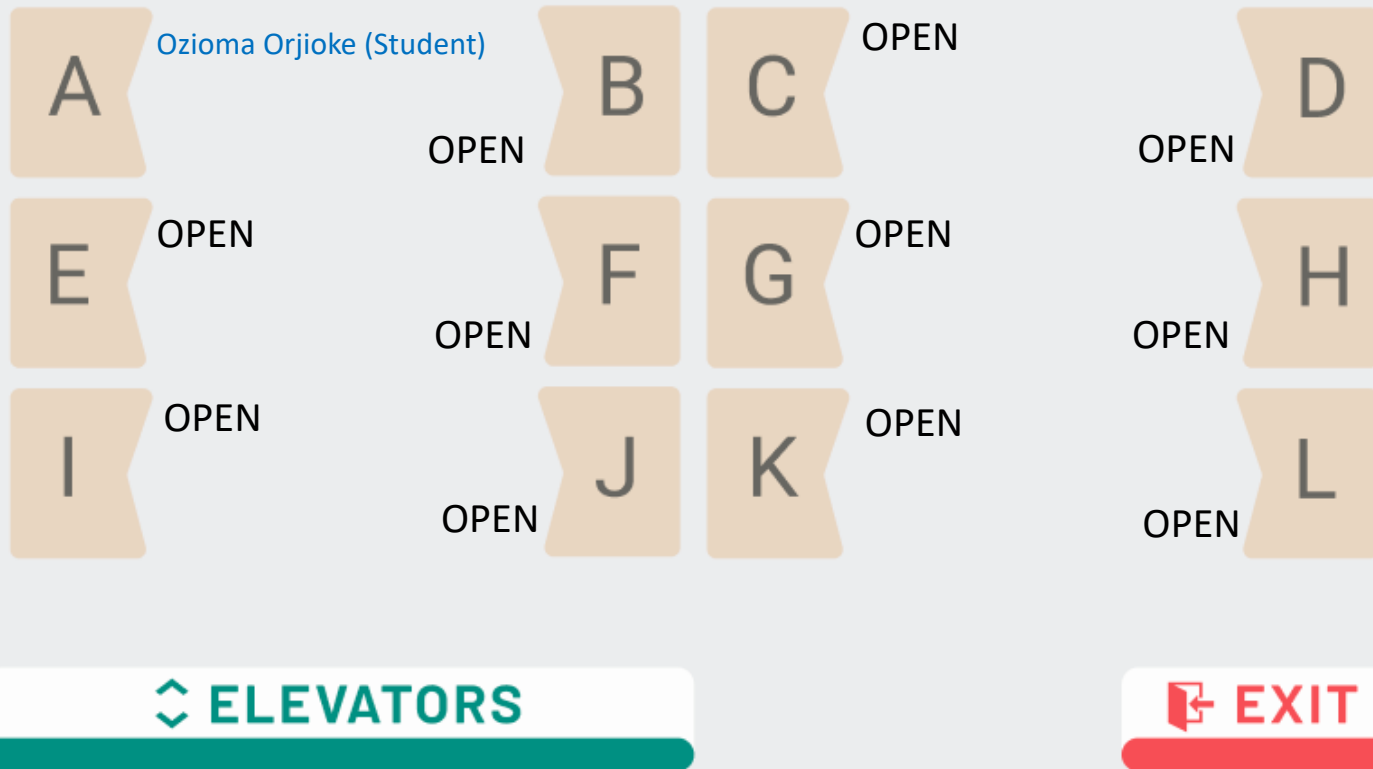


**JOIN FLOOR**

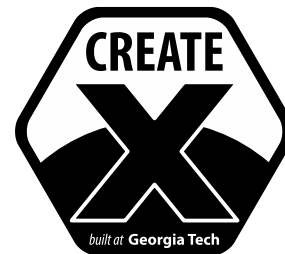
SF-A: Basketball Shooting Machine Storage	STUDENT
SF-B: Small-scale, low-cost electric generator	Dr. Simmons
SF-C: Underground Search and Rescue Autonomous Rover	STUDENT
SF-D(1-10):	Dr. West
SF-E:	Dr. Sulchek
SF-F:	Dr. MacNair

SF-G:	Dr. Sawicki
SF-H(1-2):	Dr. Smith
SF-I:	Dr. Jiao
SF-J:	Dr. Jariwala
SF-K:	Dr. Cunefare
SF-L(1-9):	Prof. Rains

# Floor 4: Student Idea (Overflow)/Create-X




If you are working on an entrepreneurial project, then consider registering for ME4723-X/X01 section.



Floor 4: Create-X

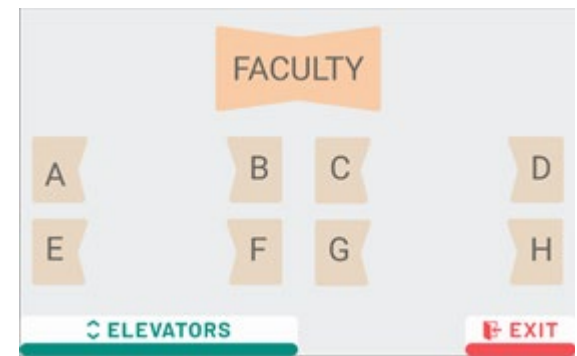
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 JOIN FLOOR

# Plan for Day 2: Lab on 19<sup>th</sup> August

## For Students and Faculty only (No Sponsors)

- 12:30pm: Continuation of course overview (joint for ME4182 and Interdisciplinary Capstone Design) on: <https://primetime.bluejeans.com/a2m/live-event/ccqwpqyz>
- 1:25pm: Switch over to <https://capstonetwo.gatherly.io/> platform with designated floors for students to mingle with respective sections. Booth setup on each floor to designate location for faculty and 8 “desks” for teams to mingle and discuss among themselves
  - Lobby: Welcome area and help desk
  - Floor 1: ME4182-A02
  - Floor 2: ME4182-A03
  - Floor 3: ME4182-A04
  - Floor 4: ME4182-A05
  - Floor 5: ME4182-A06
  - Floor 6: ME4182-A07
  - Floor 7: Interdisciplinary (Industry/own idea)
  - Floor 8: Interdisciplinary (Create-X)
  - Floor 9: ECE4873-D1A
- 1:30pm: Section instructors introduce themselves and “stay” at their desk
  - Students check [capstone.gatech.edu/marketplace](https://capstone.gatech.edu/marketplace), find them on gatherly, walk and meet
  - Formed teams take a desk location and discuss to form their bids
- 2:30pm: Instructors walk around the room at the “desk” locations to check if the teams are formed and discuss project topics
- 3:00pm: Students confirm their teams on [capstone.gatech.edu/marketplace](https://capstone.gatech.edu/marketplace)
- 3:15pm: Adjourn



Floor layout on Gatherly for  
19<sup>th</sup> August Session