Product Design Capstone

ME 4684 + 4685

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What is ME Product Design Capstone?

Employs a user-centered design approach to develop a product that solves a real problem for real people in our community.

Class size is limited… so you must have instructor permission to enroll!

1st semester: ME 4684
- 2x/week class: Product Design Engineering (in place of 5682.01)
- 1x/week lab for projects

2nd semester: ME 4685
- 1x/week lab for projects
Recent Changes to this Capstone Sequence
(in case you’d heard otherwise from past students)

1. The product design capstone sequence is offered starting fall only
   • Start in AU 20 & finish in SP 21

2. Product Design capstone is now open to all ME students!
   • Yes, even those who have previously received credit for ME 5682.01 & 5683!
   • (If you already have 5682.01 credit, we enroll you under a different course number but you come to the same classroom with everyone else)
How is the Product Design Capstone scheduled?

**ME 4684: 1st semester**
- 4 credits total. 1 credit may be applied to Technical Electives
- 2x/week class, 1x/week lab
- Class portion is the same content as the ME 5682.01 elective

**ME 4685: 2nd semester**
- 2 credits
- Once weekly lab
Schedule for Product Design Capstone AU 2020

Class Meetings:
Tuesday & Thursday
2:35-3:55 pm

Lab Meetings:
Wednesday
3:00-4:50 pm
But wait… aren't all the other ME capstones about designing products too?

- **It's true**, most (all?) students in ME capstones will end up designing a product of some sort! The point of capstone is to gain design experience.
- Our focus is on the **user-centered design process**, and we include many topics that don't typically make it into engineering design classes:
  - **Conducting User Research**: go talk to real people!
  - **Framing the Problem**: work with the people to define the opportunity at hand, and spend a significant amount of time framing the challenge
  - **Open-Ended Projects**: you work on project direction & solutions
What happens in the “class” for this capstone?

• **Topics will be the same as in the 5682.01 elective, but we’ll meet separately**

• The class will give you the background and theory of user-centered product development, product architecture, manufacturing, etc.

• Includes lots of reading, some short writing, thinking, discussing, analyzing

• In-class activities & mini projects will give you the chance to explore the material at a deeper level… and build some camaraderie with your classmates
How are the project structured?

- You get to choose many aspects of your project focus
- You get to choose your teammates (teams of 3-4 people)
- With autonomy comes responsibility!
- Teams are funded by the department, at the same rate as other capstones
- Teams start by choosing a user group or project focus-- NOT a specific product
- 1st semester: focus on research, context, and problem definition
- 2nd semester: generate solutions, emphasis on iteration, lots of prototyping
What will we do during our project?

1. Work with users to understand their problems, needs, motivations, context
2. Define the opportunity: frame the problem as an engineering challenge to address the users' needs
3. Conduct multiple iterations of concept generation, with an emphasis on visual communication (aka: drawing!)
4. Focus on a fluency of ideas: create many ideas so you can evaluate & choose the best ones to move on to prototyping
What will we do during our project?

5. Create quick, cheap prototypes (test many ideas w/out getting attached!)
6. Continually solicit user feedback for continuous improvement
7. Create many iterations of functional prototypes
8. Conduct an evaluation of the final prototype
9. Present your work: how to communicate a technical idea to a broad audience
What projects have students done in the past?

Teams have worked with...

- **musicians** to improve transport and storage of fragile instruments
- **firefighters** to design a hose management system
- **beekeepers** to design a device to more effectively weigh beehives
- **The Cincinnati Zoo** to develop an enrichment device for Asian Elephants
- **Mid-Ohio Food Bank** to develop a rainwater collection system for urban farms
- … many more!
Example: On-the-scene shadowing of firefighters at a training exercise
Example: Problem Definition Activities
Example: Visual Idea Generation
Example: Low-Resolution Prototypes
What do past students say is UNIQUE about the Product Design Capstone?

• "It gives us a better understanding of how to solve real world problems"
• "Very user oriented"
• "You spend nearly as much time researching the problem as you do solving it"
• "Intense user research: YOU define the problems you are going to address"
• "The independence is awesome!"
• "You have an opportunity to choose a project that's interesting to you & your group"
• "You get to come up with your own project & explore your creativity"
What do past students say is the BEST thing about this capstone?

• "Small class size"
• "It's relatively self paced"
• "The ability to drive direction and delegate responsibilities independently"
• "It challenges you to go out and figure things out for yourself"
• "It answers the question of, 'how does it work & why?'"
• "You get to go very in depth with the product design process"
• "We get to solve almost any problem in almost any way we want. True freedom is really refreshing"
What do current students say is CHALLENGING about this capstone?

- "Not jumping ahead to solve the problem before you define it"
- "There are almost no constraints initially, so it can be daunting to figure out what you need to do to solve a problem"
- "Trying to figure out the true root cause of a user’s problem"
- "It touches on a lot of different skills, including drawing"
- "Being diligent about working & meeting with your teammates"
- "Keeping things on schedule- your own schedule"
- "You are responsible for your own fate. You must manage time to be successful"
This all sounds great! How do I proceed?

• Enrollment is by permission of instructor, limited to ~24 students.

• **Email Professor Abell directly** to express interest and gain permission to enroll, or to ask questions / set up a meeting to talk further.
  • Share why you want to join this capstone
  • Attach your resume
When will enrollment decisions be made?

- Enrollment is by permission of instructor, limited to ~24 students.
- Decisions will be made by April 1\textsuperscript{st}

Is your course registration window before April 1\textsuperscript{st}??

- Proactively enroll in your 2\textsuperscript{nd} choice capstone to hold your place
- Proactively enroll in the 5682.01 Product Design elective to hold your place
- You can drop these courses later if you enroll in Product Design Capstone
Questions?

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