DEA 2730: Human Centered Design Methods  
**Tuesday and Thursday, 11:40 – 12:55**

- 3 credits; letter grade only; no final exam
- Enrollment limited to 25 students; priority given to DEA students; otherwise by permission.
- Prerequisites for DEA students are DEA 1101 and 1150; others by permission
- Course webpage: (linked from [https://arl.human.cornell.edu/academics.htm](https://arl.human.cornell.edu/academics.htm)).

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**NOTE:** This pdf file for the syllabus is comprehensive; however, the active and most complete documentation for this course is found in the course guide provided online at [https://arl.human.cornell.edu/DEA2730%20HCDM.htm](https://arl.human.cornell.edu/DEA2730%20HCDM.htm). Here, you will find all the information contained in this pdf file, links to most all required readings, and additional supporting documents.

1. **Course Description (50 words)**

This course explores the use of design methods to generate ideas and evaluate designed objects, environments, and interfaces. Lectures cultivate an understanding of the various methods, while hands-on activities provide opportunity to apply these methods to the design of artifacts and their interactions with people and things.

2. **Background and Definitions**

"Human-Centered Design Methods" (HCDMs) focuses on the iterative, design-research process used to design and evaluate objects and environments. HCDMs are not only used to design things, but also to design the *interaction* between things and the people who use and live in them. An "Interaction Designer" is the title of a designer who designs for things and their relationships with other things including people. As follows, Interaction design is not only about form-making and composition; it is moreover about creative and meticulous design, it is about technology, and it is about an attentiveness to the needs and opportunities of people and the planet, striving to improve life, enhance existing places, and support the interaction of human beings with their physical and digital surroundings. This course, in particular, focuses on designing interactive artifacts more than static artifacts, as interactive artifacts with embedded digital technologies are growing in number, kind, and complexity.

You can do two things, right away, on your own, that help frame the objectives for this course:

First, you can listen to "The Power of Design" and "Are the Best Designers Rebels?" on the TED RADIO HOUR.

Second, you can learn from Julie Zhao, Facebook’s young VP of Product Design. Julie explains what Facebook looks for when hiring designers. She also offers guidance on how designers can best start their careers, offering two key points:

- “You need to be good at both interaction design AND visual design. [...] If you can get to the point where everything you make looks great and makes sense, you will not have trouble landing a design job.”
- “Once your hard skills are in a good place, work on your soft skills: communicating clearly; pitching a compelling vision; knowing what matters to whom; collaborating well with others.”
On the second point, *pitching a compelling vision*, Julie offers four steps to follow that capture the core activity of this course:

- "Describe the problem you’re solving."
- "Describe how many people have this problem."
- "Talk about the solution in terms of the experience, not the product."
- "Let go of ‘mine’ or ‘yours’, embrace ‘ours’"

3. Course Objectives and Learning Outcomes

Three learning outcomes are expected of this course.

Outcome 1: To develop an understanding of how and which design methodologies can be applied in the iterative process of designing artifacts.

Outcome 2: To demonstrate the ability to develop and evaluate design prototypes responsive to the challenges and opportunities of supporting and augmenting human users.

Outcome 3: To communicate a design process in a rigorous written paper, poster, design diary, and video.

4. Course Materials

- 1 sketchbook like this one or a comparable one found in our bookstore.
- Materials required to construct your prototypes. Some of these materials and most manual and digital fabrication tools are available in our Digital Design Fabrication Studio ("D2FS") on LL2 in HEB adjoining MVR; other sources are the Cornell bookstore, Michael's at Ithaca Mall, Utrecht, and Blick.

To create functioning, interactive prototypes, you are required to embed into your prototype littleBits, electronic "bits" that snap together magnetically. Watch a TED Talk about littleBits, and review a guide on how to use them. Also watch a short video on how Havas uses littleBits professionally. Finally, you might find inspiration and ideas from Make (link) which also offers the guidebook, Getting Started with littleBits (a used copy from Amazon costs about $6 including shipping).

Your working prototypes with embedded littleBits will require:

- at least one Input bit (a sensor, such as a motion sensor or a light sensor)
- at least one Output bit (an actuator, such as an LED or a servo motor)
- one battery POWER bit, one 9v BATTERY AND CABLE

The total cost of your littleBits components does not have to be much more than $50. You can purchase your bits on the littleBits web page. You might consider using a wireless bit (e.g. the Bluetooth Low Energy bit or the CloudBit); however, unless you have a computer coding background, I would discourage you from purchasing the Arduino bit or any bits requiring it (e.g. LED Matrix). (If you are interested in designing more complex interactive systems than simple Input-Output ones for this course, take my DEA 5210 Interaction Design studio.)

5. Required Readings

Readings for each class meeting are listed in the CLASS SCHEDULE (below). These readings consist of (parts of) three books and six shorter publications. Only one inexpensive book, *The Pocket Universal Methods of Design: 100 Ways*, must be purchased; all other readings are provided by links from this page. Please read the assigned readings ahead of their class session.
The three books (the first one listed to buy):
• The Pocket Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions (readings are assigned by method number—e.g. 01, 16).
• Interaction Design (readings are assigned by chapter number—e.g. Ch.1, to p. 56).
• The Delft Design Guide (readings are assigned by letter linked from this page—e.g. A)

The shorter publications (articles and papers):
• Dow, Steve. Wizard of Oz Interfaces [WOz].
• Frayling, C. Research in Art and Design [RtD]
• Mau, Bruce. An Incomplete Manifesto for Growth
• Perec, G. Observational "Experiments" in Species of Spaces and Other Pieces
• Zimmerman, J., Forlizzi, J. and Evenson, J. Research through Design [RtD]

A useful online resource for design research methods: designresearchtechniques.com

6. Grading / Note the Grading Rubric.
Throughout this course—an intimate and intensive “conversation” across students, professor, and TA—students will have ample opportunity to receive feedback on their work. In addition, students will grade each other, and student grading will be considered in assigning grades for this course. Students will receive a grade in response to work, weighted as follows:

• (10 points) Completion of Cornell IRB’s CITI training for new human participant researchers. Email Cornell’s completion certificate to the TA before Thanksgiving break. Failure to complete this task or late submission results in 0% grade for this component of the course. No excuse.
• (10 points) Ideation. For each team (i.e. not for each individual team member), upload to our class Box folder and present in class: one manifestation of each of the ideation strategies (a list of these is found on this page, upper-left column). Four students will work together as a team and receive the same grade. You will present these materials in class (see schedule).
• (10 points) Early Concept. For each team, uploaded to our class Box folder and presented in class: at least one persona, one scenario, one "money shot" (best image) of your prototype, results of your early survey, and a "demo" of your design captured by video. Teams of students will work together and receive the same grade. You will present these materials in class (see schedule). A student peer-review evaluation form [like this one] will be used, and peer reviews will be considered in assigning 5 of the 10 points of the grade.
• (20 points) Exam. An exam tests your understanding of basic terms. You are asked to “fill-in-the-blanks” using words and numbers found in a “word bank. (Note: I do not provide my slides. I suggest you listen carefully in class, take hand-written notes, and know your basic terms.)
• (10 points) Final, working prototype. Each team will receive a grade for their prototype, as presented at the final demo, based on the course’s grading rubric.
• (30 points) Final Course Deliverables. For each team, uploaded to our class Box or Google Drive folder and presented in class: a paper, a poster, a design diary, and a video. Four students will work together as a team; however, each member of the team will be chiefly responsible for one of the four key deliverables, and will be graded for this component. Team members will make her or his assignment clear to the instructor for the purpose of grading by uploading her/his work with file name in this format: Team1_Poster_CharlesEames. Failure to concisely organize your uploaded digital files will lower your course grade 2 points out of 100 points total. Posters, papers, and design diaries are printed on one-sided paper and each sheet is pinned-up for exhibition. See the course’s grading rubric.
• (5 points) **Attendance and participation.** *Failure to attend a class without an approved excuse that was submitted by email prior to that class will lower your grade 2 points out of 100 points total.*

• (5 points) **Peer-evaluation of your work as a team member** Peer-evaluation of your work as a team member is done by online survey at the near-end of the semester.

**More about the four deliverables for this course, submitted by each team of 4:**

(1) **A paper** communicating the iterative, human-centered design process for your development of an interactive artifact. You are not reporting on all ideation strategies and design research methods; only those that make the most cohesive, compelling reporting of your design process. This paper will adhere to the requirements for a [Provocations or Work-in-Progress paper submission](https://www.sigapi.org) to the conference DIS (Designing Interactive Systems). Here is the [paper template](https://example.com) showing how to format the paper; and here is [my version of the same template](https://example.com) that offers my explanation of each part of the paper with respect to content.

(2) **A poster** [printed 30" wide x 40" high](https://example.com) for the in-class exhibition; my [guide](https://example.com) communicating the basic content of the same paper.

(3) **A design diary** containing [a] weekly photographs of your team's developing prototype, with a written description of what was learned from the research study (or studies) performed that week that informed its development (this is a one page document; here is [my template](https://example.com)); [b] the final prototype carefully photographed (including a “the money shot” and a photo of the prototype in which all components of the prototype are labeled).

(4) **A video** [my guide](https://example.com) communicating the full, cohesive story of the designed artifact your team produced, answering *why, for whom, and how it was developed*, including an overview of the methods used to design and evaluate it. The video will adhere to the requirements for the [Video Showcase submission](https://example.com) to the conference CHI (Human Factors in Computing Systems), where you will also find example videos.

Grading is on a 40-point scale that follows the course's grading rubric. You are encouraged to learn from prior Works in Progress papers linked to this course web page (see above) and those found (in the thousands) in the [ACM DL](https://dl.acm.org).

By 8:30am on December 16, you will have uploaded digital files of final versions of your paper, poster, design diary, and video to our class Box file or Google Drive. This time and date is mandated by the department of DEA and will not be changed.

7. **Policies**

**Required:** attendance, timely arrival to class, participation, and the uploading of all documents to the course Box or Google Drive folder strictly adhering to all formatting requirement and specifications detailed here, on the course webpage, and in the ACM conference website(s). Failure to fulfill these requirements will reduce your grade up to 10% of the total grade at the discretion of the instructors. Attendance at the start of class will be taken for some class sessions without advanced notice. For each absence or late arrival, email the professor and TA with an explanation, attaching supporting documentation (e.g. doctor’s note); these will be considered as a valid excuse (hardship, medical appointment) without penalty, or not. It is your education, so you should take responsibility for yourself in attending all class sessions on time.
Late submissions will NOT be accepted, except with a doctor’s note or other proof of personal crisis or hardship. Failure to submit the printed documents and digital files on-time will reduce your final assignment grade 10 points.

Grading for this course is carefully determined by the professor (and TA, if any) with thoughtful consideration of student grading by your peers. If you believe the grade for any component of this class including the final grade is incorrect, you may submit a written argument along with the component-in-question for reassessment. The written argument must reference a specific issue with the graded component of the course and must be thoroughly substantiated. The professor (and TA, if any) will together consider the request, potentially with the assistance of other faculty with expertise in the area. The reassessment will result in any of the following outcomes: no change of grade, a change of grade for the better, or a change of grade for the worse. You understand that the grade for work submitted for reassessment may result in a grade lower than originally assigned.

8. Consent
To prepare the required paper and video for this course, enrolled students may conduct peer-to-peer participant studies using their peers as participants. Methods may include interviews, observations, surveys, co-design activity, heuristic evaluations, and cognitive walkthroughs. As part of this design research activity, students conducting these studies may take written notes, photographs, and/or video as a means of documentation. This documentation may appear in papers, videos, and conferences for academic audiences. Student will not be identified by name, and no aspect of these studies should cause discomfort or risk to participants. Should any student in the class choose not to participate in any aspect of the study, or have questions about her/his participation, please make this known to the instructor. Additionally, for any work of the course submitted for publication, student authors will be identified as first authors of the submission, and the instructor and TA will follow in the list of authors of such work in recognition of their efforts in cultivating this work. If these terms are not acceptable to you, please indicate so to the instructor. Non-participation will not impact your grade for this course in any way.

9. University Statement on Academic Integrity and Honesty
Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student’s own work, except in the cases of projects that are specifically structured as group endeavors. In compliance with the Cornell University policy and equal access laws, the faculty, teaching assistants, and teaching associates for this course are available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so that arrangements can be made. Students are encouraged to register with Student Disability Services to verify their eligibility for appropriate accommodations.

10. DEA Statement on Academic Integrity and Honesty
DEA is dedicated to fostering a respectful and accepting learning community in which individuals from various backgrounds, experiences, and perspectives can embrace and respect diversity. Everyone in this community is empowered to participate in meaningful learning and discussion, regardless of an individual’s self-identified gender, sexual orientation, race, ethnicity, religion, or political ideology. We encourage students to share their uniqueness; be open to the views of others; honor and learn from their colleagues; communicate in a respectful manner; and create an inclusive environment.
11. Schedule

08.29 | 01 Course Organization and Definitions
> READ: Ch. 1; 02; Mau, B. "An Incomplete Manifesto"
> IN CLASS: form teams of (ideally) four members; define your problem.

09.03 | 02 Introduction to Ideation and Design Research Methods
> READ: Ch. 9; 56; Design C; Prob Def; Lit Review; Requir.s; Mind Map; NY Mag
> IN CLASS: ideate with a Mind Map.

09.05 | 03 Ideation: Prototyping
> READ: Ch. 8 to p. 268; 11, 53; Prototyping; WoZ; lishi; Explore different littleBits
> IN CLASS: prototype with craft materials; perform an observation study.

09.10 | 04 Interfaces / Ideation: Mood Boards
> READ: Ch. 5 to p. 147; 14; 47; 66; 99; Mood boards
> IN CLASS: ideate with a mood board.

09.12 | 05 Ideation: Morphological Charts
> READ: 36; Morphological Chart (more)
> IN CLASS: ideate with a morphological chart, and prototype with littleBits.

09.17 | 06 Ideation: Storyboards
> READ: 58; 82; Storyboard (more, and an example)
> IN CLASS: ideate with a Storyboard.

09.19 | 07 Interaction Design in Practice (including IRB and Agile UX)
> VIEW: PBS video on GIFs; Using Photoshop for GIFs; (ex.s 1, 2, 3, 4)
> IN CLASS: create an animaged GIF of your design (what it does)

09.24 | 08 Personas, Scenarios, Role Playing
> READ: 63; 71; 72; 73; 84; Scenario (more); Role Playing
> IN CLASS: genearte personas; write a scenario.

09.26 | 09 Design Research Methods: Observation, Ethnography, Triangulation
> READ: Ch. 12; 42; 57; 59; 61; 91; Observations; Perec, G. Observational "Exp.s"
> IN CLASS: users role-play your scenario and complete a survey (use Google Forms).

10.01 | 10 Design Research Methods: Interviews [Present: Ideation Strategies]
> READ: Ch. 13 to p. 398; 43; 48; Interviews; Focus Groups
> IN CLASS: Present to the class your ideation strategies and results of your survey.

10.03 | 11 Design Research Methods: Surveys [DUE: Ideation Strategies: 10 pts]
> READ: Ch. 13 pp. 398-407; 67; 83; Surveys; Review survey examples above.
> IN CLASS: use Google Forms (help if needed) to generate your team's survey focussed on user experience and user response to design alternatives; conduct your survey with 5 participants; analyze, reflect, and iterate your prototype.
10.08 | 12 Design Research Methods: Iterate
   > ITERATE YOUR PROTOTYPE
   > IN CLASS: iterate your prototype based on the design research methods used.

10.10 | 13 Presenting in Spoken Words and Images
   > VIEW: Steve Jobs
   > IN CLASS: generate your money shot (ex.s 1, 2, 3 and 4)

10.15 | [F A L L  B R E A K]

10.17 | 14 [No lecture: Presentations] [Present: Early Concept: 10 pts]

10.22 | 15 [No lecture: Presentations] [Present: Early Concept: 10 pts]

10.24 | 16 Design Research Methods: Think-Alouds, Heuristics
   > READ: Ch. 13 pp. 407-412 and 419-425; 13; 46; 87; Methods Compared
   > IN CLASS: perform a Think-Aloud with 5 participants, analyze, reflect, and iterate

10.29 | 17 Design Research Methods: Usability Studies
   > READ: Ch. 14 to p. 447; 93; 94; M Heuristic Eval., (Nielsen's Heuristics), SUS
   > IN CLASS: perform a Standardized Usability Study (SUS) (my version) with at least 5 participants; analyze, reflect, iterate.

10.31 | 18 Design Research Methods: Delphi Method; Quasi-Experiment Studies
   > READ: The Delphi Method
   > IN CLASS: perform a Delphi Method study with another team as your participants, analyze, reflect, and iterate.

11.05 | 19 Design Research Methods: Web Survey, Crowd Sourcing, Analytics
   > READ: 23; 97; Google Forms, Qualtrics, Survey Monkey, Mechanical Turk
   > IN CLASS: perform a web survey with Google Forms (help at this link)

11.07 | 20 Reporting: Research through Design
   > READ: 70; Rtd; Frayling Research; Zimmerman Rtd; V Videos; Paper Template
   > IN CLASS: review poster/paper/video examples above, assign team members

11.12 | 21 [No lecture: Presentations] [Present: Design Diary]

11.14 | 22 Workshop - Paper, Poster and Video [DUE: Design Diary: 40 pts]

11.19 | 23 Workshop ...

11.21 | 24 Workshop ... [DUE: Paper Draft: not graded]

11.26 | 25 Workshop ... [DUE IRB Completion]

11.28 | [T H A N K S G I V I N G]
12.03 | 26 Workshop ... [DO: Course Evaluations]
    > IN CLASS: share with us whatever you'd like to advance your efforts. In the last 20 minutes of class, we ask you to complete the online course evaluations for this course.

12.05 | 27 Workshop ... [EXAM: 20 pts]
    > At start of class: Pin-up on walls your printed poster, and lay-out on tables each individual page of your paper and printed design diary. Bring in (and "install" as needed) your prototype for the demo.

12.10 | 28 Demos, Posters, and Video Showcase
    > Before class: (1) upload a Word doc with your URL (YouTube or Vimeo) linking to your draft video; (2) upload and print your draft paper; (3) upload and print the poster (30" wide x 40").
    > Bring to class: your prototype and all the printed documents above.

12.16 | [UPLOAD ALL FILES by 8:30am (see below, red type!); 40 pts]
    Your grade for these 40 points is what we find from you in our shared file at 11:30am. Remember to label your uploaded file with your name and deliverable (e.g. Team1_Poster_CharlesEames.pdf or Team 4_AnaBell-video.doc where this Word doc has the URL to your posted video).