SI 582, Winter 2014 Section 1
Introduction to Interaction Design

Learning Objectives
● process-focused perspective on interaction design
● design methods and skills
● sketching techniques
● scenarios and storyboarding
● wireframing and prototyping
● thinking critically about design solutions

Lectures: Monday, 5pm - 8pm
Location: NQ 2245
Instructor: Eric Cook
Contact: ericcook@umich.edu
Office Hours: Weds. 3 - 4pm & Friday, 1 - 2pm
Office Location: North Quad 4369
Syllabus: http://tinyurl.com/SI582-Win14-1

Summary
In this course, students will learn methods and skills involved in designing and prototyping interactive systems. The course covers the design process from the initial formulation of a design problem to creation of digital prototypes. The class structure is a mix of classroom design activities, lectures, and design critiques of student work by peers and instructor.

Overview
<table>
<thead>
<tr>
<th>Date</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1: What is interaction design? Approaches to design</td>
<td>1/13 --</td>
</tr>
<tr>
<td>*** MLK Day: no class ***</td>
<td>1/20 --</td>
</tr>
<tr>
<td>Week 2: Design Critiques + Communicating with Stakeholders</td>
<td>1/27 Project problem statement + short bio</td>
</tr>
<tr>
<td>Week 3: Core concepts of Design</td>
<td>2/3 Project design approaches</td>
</tr>
<tr>
<td>Week 4: Ideation + Sketching</td>
<td>2/10 Competitive analysis</td>
</tr>
<tr>
<td>Week 5: Personas + Stories</td>
<td>2/17 Sketching alternatives</td>
</tr>
<tr>
<td>Week 6: Scenarios + Storyboards</td>
<td>2/24 Personas</td>
</tr>
<tr>
<td>*** Winter break: no class ***</td>
<td>3/3 --</td>
</tr>
<tr>
<td>Week 7: Design Synthesis + Prototyping Tool Selection</td>
<td>3/10 Scenarios &amp; Storyboard</td>
</tr>
<tr>
<td>Week 9: Paper prototype peer walkthrough + Working Session</td>
<td>3/24 Individual Project Paper prototype</td>
</tr>
<tr>
<td>Week 10: Digital Prototyping</td>
<td>3/31 Digital Prototype v1</td>
</tr>
<tr>
<td>Week 11: Evaluation &amp; Responding to Evaluation</td>
<td>4/7 Digital Prototype v2</td>
</tr>
<tr>
<td>Week 12: Presentations</td>
<td>4/14</td>
</tr>
<tr>
<td>Week 13: Presentations + Wrap-up</td>
<td>4/21 Final digital prototype + Write-up</td>
</tr>
</tbody>
</table>

Materials
No textbook is required for this class. Course readings will be posted as PDFs and links on the course website. Each week, you should bring to class a sketchbook and a dark pen, pencil, or other sketching tool(s) of your choice (e.g., an iPad or another tablet).
Individual Project

The centerpiece of this course is a design project that you will develop, over the course of the semester, from the conception of the problem you want to solve, through design research and ideation, to the stage of a digital prototype. Along the way, you will create a number of artifacts that represent different stages of the design process (sketches, personas, low-fi prototypes, etc.). We will use the class activities and homework to move the projects forward. The project for this class is an individual project. The idea is that each student can focus on a problem she really cares about—whether because it connects to her research interests or an aspect of her personal life—and then get the experience of going through the steps of systematically developing a solution to that problem. A side effect of this setup is that at the end of the semester, each student will have a body of her own design work that she can use in your portfolio or as a starting point for developing the project further.

Design Problem:
Social software continues to pervade our daily lives, influencing with whom we connect, the news to which we are exposed and the entertainment with which we amuse ourselves. Yet in addition to our online social networks of friendship and shared interests, everyone also lives in a specific physical community—a neighborhood. Each neighborhood is a locale with a distinct mix of individuals, resources and needs, with the particular complications of space, awareness and privacy that go along right in hand. Considering both the benefits and challenges of physical proximity, what kinds of applications, interactions or services can we design that support and leverage our neighborhoods?

Over the course of the semester, your project will be to design a system to an activity or relationship within the particular context of a neighborhood that is important to you but which is not sufficiently well supported by current tools. This context may take many forms, such as sharing of resources (i.e. a book exchange, carpool system, parking swap), organizing neighborhood events (i.e. a block party, picnic or holiday celebration), providing social support (i.e. sharing duties for childcare or eldercare) or encouraging local civic engagement (i.e. organizing a park clean-up day or community garden). These ideas are a starting point, but do not feel limited by them.

As part of your project, you’ll need to define what the specific neighborhood-focused activity is you wish to address and what aspects of it you are trying to support. Think about how that activity is currently supported via technology, what doesn’t work about current ways of supporting it, and how your solution will do this better. The specificity of addressing a particular neighborhood allows you to deeply think about what makes the location/community unique and how you would best want to support it. So, dive in and see what you can come up with.

Scoping: One way to think about scoping is in terms of the number of steps or interactions that your system will support. Think about the process of shopping on Amazon. You first search, then the results page appears, then you click on a result to see the details for that item, then you add the item to cart, then you click to check out, etc. Each of these steps—entering a search term, clicking on a result, adding an item to cart—is a user interaction. Some of these interactions happen on the same page (e.g., adding to cart and clicking the Check Out button both happen on the item details page), while other interactions move the user to a new page (clicking on an item in the results list open the page with the detailed information for that
For your project, you should aim to prototype between **15 and 30 user interactions** (steps through the system) that take place across **5 to 10 panels** (e.g., web pages, screens of a mobile application). Most of the panels should be unique.

**Final note:** this is an interaction design class, which means that we are focusing on the front-end or user-facing aspects of technology: web pages, mobile apps, the control interface for home automation systems, etc. There are a lot of interesting problems which have a user-experience component, but which are ultimately not front-end problems. For instance, the order in which Yelp or Amazon results appear is fundamental to the user experience of these systems and is something these companies spend a lot of time thinking about and working on. However, determining the results order would not be a good project for this class since this is an algorithmic problem, not a user interaction problem. Pick a project that lets you develop a set of interesting user interactions, not something that is fundamentally about under-the-hood machinery.

**In-class Group Practice Project**

You will participate in an in-class group project each week. The purpose of the group project is twofold: first, it will give you an opportunity to practice skills we learn in class, so you can get some experience with them before you need to apply them to your individual projects. Second, it gives you a chance to work on a second project during the semester, providing you with additional material for your portfolio.

Group assignments for your in-class practice project and your individual project peer critique group are posted in the Resources section of Ctools.

**In-class group project domain: Food**

Regardless of our age, nationality or culture, food is a central aspect of human life. We eat out of necessity, but we also choose what we eat to serve particular ends, whether for health, for pleasure or for comfort. We cook at times simply to put meals on the table, but also because the act of cooking itself can be both avocation and vocation. We can buy food with an eye on price and convenience, but also to experience new tastes and sensations. Consumption of food can be an individual, utilitarian experience, or it can be deeply social in nature, building and reinforcing friendships, relationships and connections to culture.

For your group project, select one aspect of food in your lives (eating, sharing, buying, preparing, etc) and consider how it might be supported more effectively. Define the aspect/activity that you are addressing, why it is important, and why it is currently not adequately supported. Then, design a better way that that activity could work.

The purpose of the in-class group project is not necessarily to generate a perfect or polished end-result, but rather to continually practice the design techniques and topics we will be covering throughout the term. Learning by doing is more effective than through passive listening. To encourage you in this, your participation grade will be determined in part by your consistent and ongoing engagement with your in-class
At the end of each class when we are doing group work, please submit your work from that day via email to the instructor with a list of all group members who were there and worked on the project that day. These artifact will serve as a base for your participation grade.

**Homework**

Each week there will be a homework assignment. Homeworks will be due before the start of the class each week. Please post all homework assignments to that week’s homework thread in the class forum on Ctools. Most homeworks are worth 4 points each. Late assignments will lose 1 point per day. While the focus is on quality instead of quantity, not following the directions will result in a deduction of points. Do not upload attachments to the forum. Submit your assignment as a link (e.g., to a Google Doc, a file shared through Dropbox, Box, SugarSync, etc.).

Reading Response: Each week you will also have a 3 paragraph reading response for the readings from that week. The reading response should reflect on the readings and discuss points from the reading you found particularly interesting—for instance, because you found them provocative, you disagree with them, you think they relate to your own project in an interesting way, etc. The purpose of the reading responses is to show (1) you did the readings (so you can discuss and utilize them intelligently during class) and (2) you thought critically about them. Reading responses that show you engaged critically with the material will receive 2 points. Reading responses that summarize the readings without much more thought will receive 1 point. Minimal or no responses will receive 0 points.

**Design Notebook**

As you begin to think about individual project, you should create a design notebook—a place (physical or digital) where you collect as much information that relates to your project as you can find (e.g., screenshots or pictures of other systems that address a similar problem, printouts of messages in online forums where people discuss the problem you are working on, photos of things you encounter in the street, replies from Facebook to a question you posed to your social network, etc.). As you will discover, the design notebook can be a wonderfully effective source of inspiration and will help you generate both more ideas and better ideas for how to proceed with your project.

**Grading**

You should do good work in this class because you care about the project you picked and because you want to learn how to design interactive systems. That said, the university makes us use grades, so here is how grades will work in this class:

- **Individual project:** 68 points
  - Paper prototype: 10 points
  - Final digital prototype & writeup: 20 points
  - Other project homeworks: 4 points each (8 weeks * 4 points)
  - Final presentation: 6 points
- **Reading responses:** 20 points (2 points/class * 10)
- Class participation/In-class group work: 12 points

You will submit homework and reading responses to the class forums on Ctools.

Final Grades will be assigned according to the following scale:

- A+: 98-100%
- A: 94-97%
- A-: 90-93%
- B+: 88-89%
- B: 84-87%
- B-: 80-83%
- C+: 77-79%
- C: 73-77%
- C-: 70-72%
- D: 60-69%
- F: below 60%

Late assignments

Many of our classroom activities will involve getting feedback from your peers and the instructor on the work you did for your homework. For this reason, it is important that you finish your homework in time and come to class prepared to discuss it. To encourage timely completion of assignments—and, thus, your ability to fully participate in the class—late homework assignments (those valued at 4 points each) will be penalized 1 point per 24-hour period. Late reading responses will not be accepted and late prototypes will only be accepted in special circumstances and with prior arrangement with the instructor.

Attendance

This class does not have a formal attendance policy but your in-class group activities and class participation grade both rely on you being in class. We will do individual and group activities in class each week. You are responsible for finding out what you missed in class by referring to the syllabus and your classmates.

Accommodation for students with disabilities

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way we teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate accommodations. SSD (734-763-3000; http://www.umich.edu/~sswd/) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information you provide as private and confidential.

Academic integrity

Unless otherwise specified in an assignment, all submitted work must be your own, original work. If you are referencing others' work, put it in quotes! If you are directly quoting, or building on others' writing, provide a
citation. See the Rackham Graduate policy on Academic and Professional Integrity for the definition of plagiarism, and associated consequences.

Schedule

Week 1: What is interaction design? Approaches to design

Readings & Resources:
(No reading response due this first week.)


Case Study: How to design breakthrough inventions: http://www.cbsnews.com/video/watch/?id=50138327n

Homework due this week:
none

Week 2: Design critiques + Communicating with Stakeholders

Readings:
Reminder: Reading responses (see above) are due in Ctools Sunday night before lecture.


Design Critique and the Creative Process
http://www.alistapart.com/articles/design-criticism-creative-process/

Homework due this week:
Short Biographical Statement: Add a one paragraph biography of yourself to the course forum on Ctools. Include your prior education, work experience if you have it, and your background in interaction design if you have any. This could be particular skills you have or any software tools you know how to use related to design, prototyping, etc. If you have developed any kind of interactive system before, please note that too.

Individual Project Design Problem Statement: Submit a 1-page problem statement for your individual project. Specify what particular activity you intend to support in a given neighborhood context. Describe what you believe is done currently do to support this activity, what works well and doesn’t work well about that
current practice. Finally, think about what the essential functions are that a tool would need to have that would, from your perspective, support this neighborhood activity in a robust way. Your goal is to consider the human and social nature of the problem and what existing designs lack in addressing the problem. You can optionally cite related work or resources that will not count towards your one page limit, but this is not required.

**Week 3: Core concepts of Design**

**Readings:**


Lidwell et al “universal principles of design” (login via Mirlyn for full access): [http://my.safaribooksonline.com/9781592535873](http://my.safaribooksonline.com/9781592535873)

Suggested sections: Affordance, Accessibility, Archetypes, Constraints, Consistency, Form follows Function, Flexibility-Usability Tradeoff, Hick’s Law, Ockham’s Razor.

*Required, but just skim:*


**Homework due this week:**

*Design Approaches*: Submit a 2-page write-up that describes at least three different design approaches you could take in addressing your individual projects’ design problem. Try to make these approaches as diverse as possible from one another. For instance, consider the different types of technology or infrastructure you could leverage, or different strategies that you could embody in your system (e.g., for an application that helps you maintain awareness of the physical condition of elderly members of the community, you might consider whether other caregivers will be interacting with the system; if the user population will include individuals with sensory or cognitive impairments that will need to be addressed; whether the individual(s) in question would actually use a given type of technology or tool and so forth). Your approaches should be developed within the context of interaction design. Consider how users might interact with a proposed system, what problem it will solve, and why it would be an improvement over existing solutions.
**Week 4: Ideation + Sketching alternatives**

**Readings:**


**Homework due this week:**

*Competitive Analysis/"Bug List":* Regardless of the particular problem/context you are focusing your project around, it is likely that someone has attempted a prior design in response to a similar issue. For this assignment, take a critical look at existing systems within your context and articulate what their deficiencies are in respect to supporting your target activity. In industry, this is called “competitive analysis” and in academia “related work.” As you research these systems, compile a list of problems or frustrating aspects of the current solutions to your problem. This list can be a starting point for your thinking of how your own solution can do things better. Submit a link to your list of problems and frustrations with other systems as part of your homework assignment (Bill Buxton calls such lists the “bug list”).

**Week 5: Personas & Stories**

**Readings:**

Chapters 2, 7, 8 , 9 in Quesenbery, W. & Brooks, K. (2010). *Storytelling for User Experience: Crafting Stories for Better Design*. Brooklyn, NY: Rosenfeld Media. (Don’t worry, they are short.)

[http://interaction-design.org/encyclopedia/personas.html](http://interaction-design.org/encyclopedia/personas.html)

**Homework due this week:**

*Sketching Alternatives: Take a 11"x17" piece of white paper and divide this paper into 40 2"x2" squares. Sketch 40 solutions to your design problem, one in each square, writing a brief caption for each to help someone else understand the idea each sketch conveys.*
A few important guidelines:

- Focus on quantity not quality
- No two ideas should be alike
- Include ideas from existing products or prior research
- Every caption should include an active verb, conveying what the solution does to address the problem.
- If you get stuck, think about different contexts in which your system could be used to inspire new ideas

Submit a link to a digital version of your 40 squares (a scan, a photograph, etc.).

**Week 6: Scenarios & Storyboarding**

**Readings:**


**Homework due this week:**

*Personas:* Develop 3 to 5 sample personas of sample users for your design. These may be chosen to be particularly emblematic of the audience(s) you are targeting. To make them as useful as possible, consider maximizing the diversity of characteristics amongst the personas you develop, such that they are illustrative of a wide range of user needs, motivations, skill levels and so forth.

**Week 7: Design Synthesis + Prototyping Tool Selection**

**Readings:**


Case Study: [http://vesperapp.co/blog/how-to-make-a-vesper/](http://vesperapp.co/blog/how-to-make-a-vesper/)

**Optional Resources**

You do not need to read these in detail, but may find it helpful to skim while selecting which digital prototyping tool best suits your needs.


**Homework due this week:**

**Scenario:** Building on the personas developed last week, create a set of task scenarios that demonstrate a sequence of actions the user(s) will have to go through in order to achieve their practical goals. You will use these scenarios both to guide your designs and to assess your designs throughout the rest of the project. You should end up with 3 to 5 primary scenarios; more than this will make it difficult to focus.

**Storyboard:** Design a storyboard that shows how a user or users will interact with your design. The storyboard should highlight important aspects of how your design will be used along with transitional frames that show how a user will navigate through the system. Submit at least 1 storyboard with 5 frames (or 2 storyboards with 3-5 frames). The scenario is the story or script of how a user will use your system and the storyboard is a graphic depiction for how the story will play out in the system. A storyboard is an early version of paper prototypes of the screens in your system.

A note: to make storyboards useful, try to think about what you can learn from drawing your solution out, over what you can get from just a narrative scenario. In other words, a storyboard should be a little more than just a drawn scenario. Try to represent physical environment or other type of context (e.g., location of other people) which might help you think through how your system needs to work.

**Week 8: Paper Prototyping**

**Readings:**


Case Study: Wii: [http://iwataasks.nintendo.com/interviews/#/wiiu/miiverse2/0/0](http://iwataasks.nintendo.com/interviews/#/wiiu/miiverse2/0/0)

**Homework due this week:**
**Design Synthesis & Design Defense activity:**
Take the alternatives you sketched out and brainstormed on in week 5, and developed via personas and scenarios in week 6. Cluster these alternatives into ~3 to 5 high-level functional categories. Explain why these are clustered in this way. What is consistent? What was redundant? What is unrelated? Pick an approach: choose the one functional category that you want to develop for the remainder of the term, and articulate why this is the one chosen (best fit, most realistic address to constraints, etc.)

**Week 9: Paper Prototype Peer Walkthrough + Working Session**

This week will be a working week. For the first portion of class, we will be evaluating each others' paper prototypes. Any additional time will be allocated for all to catch up on their individual projects, to receive feedback from the instructor (and your peers) on the current direction of your design and to receive peer support on prototyping software.

**Readings:**
None. No reading response due this week.

**Homework due this week:**

*Paper Prototype:* The goal of this assignment is to learn how to use low-fidelity prototyping in the early stages of design. Using paper, sticky notes, scissors, tape, and any other supplies you may want to use, create a paper-prototype of your project solution. Focus on tasks and interactions. You do not have to prototype the whole system, but try to prototype as many of the interactions you are planning to implement in your medium-fi prototype as you can. Prototype at least 10 tasks and at least 10 interactions (interactions can be as small as clicking a button to select an item and as large as searching for an item and having an entirely new screen show up). Try to have a reasonable balance of some bigger and some smaller interactions--I want to see a rich and diverse set of interactions in your prototypes. To make this exercise as useful to you as possible, make sure to prototype all the interactions about which you are uncertain and for which you’d like to get feedback from your peers and me. In your writeup, describe the design decisions you made, what did or did not work well in the process, and what you might do differently if you re-designed your prototype. Your submission on Ctools should include a write-up of least 1 page of single-spaced text plus a video (using a phone camera is perfectly fine) of your paper prototypes. *Bring your paper prototype to class for Week 10.*

**Week 10: Digital Prototyping**

**Readings:**


Homework due this week:

**Digital Prototype Version 1:** First version of digital prototype. This should be based on your scenarios and storyboards and your designs from earlier assignments. Figure out what tools you want to design your prototype in and start to translate your storyboard into an interactive prototype. Your final digital prototype should have at least 15 interactions, where an interaction is defined as having a trigger (e.g. click, button) cause an event (e.g. new screen). Your digital prototype should look polished and visually appealing, but the focus is on the interactions. It should look like something that you would be excited to show a client, or colleague, or boss. (Version 1 is a feedback-only assignment; it is a process step to ensure you are making progress on this large deliverable)

**Week 11: Evaluation & Responding to Evaluation**

**Readings:**


+ Additional readings TBD

**Homework due this week:**

**Digital Prototype Version 2:** Keep plugging away on your digital prototypes. Upload link to the current state of your project.

**Week 12: Presentations**

**Readings:**

None. No reading response due this week.

**Homework due this week:**

While the final prototype and write-up are due at midnight on April 21st, presentation of your projects will begin on April 14th in class.

**Presentation details**
Presentation length: **5 minutes**. This length will need to be strictly followed to ensure that everyone gets a chance to present their project and that we finish the class on time. During class this week and next, everyone will do a brief presentation of their project. Bring your laptop to class next week. If you have a Mac, bring a dongle.

Presentation content: The main purpose of the presentation is to showcase to the class what you have been working on this term. To do this effectively in such a brief time, I’d suggest something like the following structure:

- A brief description of what problem you tried to solve in your project and why this problem is important.
- A high-level overview of your solution. (e.g., "I created a prototype for a mobile-phone application that..."
enable users to do X, Y, and Z."

- A walkthrough of one of two key features of the application. You can do this with screenshots in your slides, or you can create a video that walks the audience through these features. Please don't try to do a live demo! With 5 minute presentations, a live demo just won't work well. Script what you want us to see and then either video-record it or practice to do the walkthrough effectively with slides.
- The design rationale for an important design decision you had to make during the project. This is to give us a flavor of the kind of thinking that went into the project.

The above is a suggested format, but this format is not required. If you think you can give an effective introduction to your project using a different format, go for it. Feel free to do whatever you think will give your peers and me a good understanding of what you did and how you thought about your project. (As long as it doesn't take any longer than 5 minutes!)

Logistics: please bring your presentation on your own laptop or arrange in advance to share the laptop with another student in the class (and have the presentation preloaded on the machine). We'll need to transition between people pretty quickly.

**Week 13: Presentations (part 2) + Overall Wrap-up**

Presentations conclude today. See week 13 for presentation details.

**Readings:**
None. No reading response due this week.

**Final Digital Prototype:**
Upload a link to your prototype or a video of your prototype to forum on Ctools.

**Final Write-up:** Your write-up should be 3-5 pages single-spaced with sketches and screen shots as appendices, these don’t count for the page limit. Please don’t feel the need to add as many screenshots as you possibly can. Select ones that convey useful information. Focus on quality and polish as if you were delivering it to a client.

Suggested outline for writeup:
1. Problem statement.
2. Solution overview
3. Describe the final design
   - Describe the functionality (i.e., what you can do with it)
   - Provide a description of the main parts of the design flow. This is important because it will provide you with a record of how the design worked or was intended to work, long after the implementation no longer works. It could in principle also act as a deliverable to hand off to an implementor.
   - What was left unimplemented?
   - Sketching techniques and approaches
   - Tool(s) you used to develop the design
   - Pros and cons of these approaches and tools for your project
5. Design Evolution

- Describe how your design changed from initial sketches, brainstorming, low-fidelity prototype, to final design
- Show what the major changes were and why they were made.
- Relate your design process and choices to the readings.

*Please upload your write-up as a PDF document to the Assignments section of Ctools (i.e., not the forum, as have been doing for previous assignments). Make sure that your write-up contains the link to your prototype.*