Introduction to User-Centered Design and Prototyping

Course Syllabus - COMP 494 (Fall 2020)

Course Instructor

Dr. Jennifer Olsen

- **Office**: Guadalupe Hall 103
- **Email**: jenniferolsen@sandiego.edu

Given current COVID-19 safety measures, the best way to contact me is through email.

Course Location

Location: Zoom (link found in blackboard)

Schedule: MWF 11:15-12:10

Office Hours

Location: Zoom (link found in blackboard)

Schedule:

Monday 1:00 pm - 2:30 pm
Tuesday By appointment only
Wednesday 2:00 pm - 3:30 pm
Thursday 11 am - 12 pm
Friday 12:30 pm - 1:30 pm

To help mitigate wait times during office hours, each block will be broken into 15 minute slots that you can sign-up during. Feel free to drop by during office hours if you have not signed-up for a slot but know that you may end up waiting. If you ever cannot make the office hour times, please feel free to email me to schedule an appointment.

Course Goal

Why study human-computer interaction? Computers are not only used by experts but are now common for most professions and everyday use. When we design something, it is important to consider the context that it is going to be used in and by whom to make something that aligns with the needs of the user. This user is not you and may not even be the person purchasing the product. To design something that will be used, it is important to

have the user involved in the process early and often. In this course, we will go over the principles of user-centered and iterative design to focus designs on empirical evidence.

Who should take this course? This course will be useful for anyone working on an interdisciplinary team to develop software. During this course, you will become familiar with the different steps in the development process enabling you to have conversations with different members of a team who have different requirements and perspectives to come to a working solution. The course will also encourage you to step back from the immediate task you are doing to consider the larger picture of the users' needs.

Course Learning Outcomes

By the end of this course, you will be able to:
- Describe design patterns and languages and types of ideation
- Distinguish different user needs analysis methodologies and select an appropriate methodology given a situation
- Compare different phases of prototyping and prototyping tools for their different features and uses
- Compare different methodologies for user testing and when they are used
- Evaluate a situation to identify a design need
- Apply a user-centered design process for needs analysis
- Apply an iterative design process accounting for user feedback
- Demonstrate a user-centered mindset and openness to different perspectives

High-level Schedule of Course Topics

Below is a list of topics that I expect to cover during the course. It is tentative and subject to change based on how we progress throughout the semester. Below is a more detailed schedule that I will keep up to date based on changes during the semester.

1. Design principle and affordances
    1. History of HCI and affordances
    2. Design patterns, principles, and language
    3. Ideation and features
2. User needs
    1. Gathering user data
    2. Data-driven analysis
    3. Personas and scenarios
3. Prototyping and usability testing
    1. Lo and hi-fidelity prototypes
    2. Prototyping tools
    3. Usability testing methodology
    4. Design heuristics

Course Materials

Course Website:

Blackboard Learn (Olé)

We will use Blackboard as the primary site for information for this course. On Blackboard you will find the lecture slides from the week, reading assignments, and group assignments. You can also use the discussion board to ask questions and to post your reading reflections. You can log in using your MySanDiego login name and password.

Required Readings and Videos:

You will find readings in three places for this class. I will either post a reading to Blackboard, a name of a chapter for a book that can be found electronically through the library (these will be marked as such), or a link to an article online. In the schedule I will clearly state where each reading can be found. The readings will come from a range of sources throughout the semester. Some will be from more typical textbooks, some from articles or websites, and some will be research papers.

Required Software:

All software used in this course will either be available freely or with a free trial. If there are issues with downloading any of the software, please let me know as soon as possible so we can make other arrangements.

- Powerpoint/keynote/google slides
- Invision
- Pop by Marvel
- Axure

Discussion Board:

Blackboard Learn (Olé)

Throughout the semester, we will use the discussion board for two different purposes: required reading posts and Q&A. For each of these different purposes, there will be different forums in Blackboard. It will be important to post to the correct forum.

For the required readings, the forums will be graded and will not be anonymous, as you are required to post.

The Q&A forums provide a place for everyone to quickly ask questions. The forums will allow not only me to answer questions but for you all to answer each other's questions. It also allows information and questions that many students have in class to quickly be shared. Before asking a question, you should check the forum to see if it has already been asked and answered.

For the Q&A, I would like to remind you that there are not any silly questions. If you are concerned though, you will be able to post anonymously in the Q&A forums.

As a reminder, always be respectful and supportive in the forums. We want to build an inclusive community!

Evaluation

The grading in this course is meant to be transparent and to encourage continuous learning throughout the course. Your final grade will consist of the components listed below. Each of these components are then described in more detail and the expectations for each item. Please make sure you read them carefully. If anything is unclear, please feel free to ask me.

- **Group Project** (8): 50%
  - Assignment 0 (What is in a communication tool?): 5%
  - Assignment 1 (Choosing a topic and competitive analysis): 10%
  - Assignment 2 (User research): 20%
  - Assignment 3 (Brainstorming & Defining needs): 15%
  - Assignment 4 (Prototyping tool presentation): 10%
  - Assignment 5 (Lo-fi prototype testing): 15%
  - Assignment 6 (Hi-fi prototype testing and Heuristic Analysis): 20%
  - Assignment 7 (Presentation): 5%
- **Readings and Discussion Posts**: 15%
- **In-class Quizzes** (5): 10%
- **Class Participation**: 5%
- **Final Exam**: 20%

I do make grading mistakes. If you happen upon such an error (e.g. incorrect or missing grade), let me know. All requests must be made including the error that was made and your reasoning for why you think this is an error. This is to show that you have given thought to the material before making the request.

Group Project

The group project will be your main opportunity to apply what we are learning in class to a real-life example. For the project, you will work in groups of three assigned by the instructor. Your group will stay constant throughout the semester. With your group, you will pick a software product of your choice that you would like to design. I suggest not trying to do something too complex because it will become difficult trying to test all of the features!

The project will be divided into eight assignments as outlined above with the different parts being due throughout the semester. At the end of the semester, you will give a presentation of your project. If you miss this group presentation, you will receive a 0 for that part of the project, but it will not impact your group members' grades. Half way

through the semester, I will set-up meetings with each of the groups to discuss their progress. If you would like a meeting in addition to this time, please email me.

Although this is a group project, that does not mean your whole group must be present for all activities. Each group member is responsible for the assignment and understanding what was done by the group. In this case, it will be important to have group meetings to make decisions and work on some tasks together. However, some tasks may be better divided, especially when it has to be done multiple times. For example, for the interview assignment, the group will be required to interview multiple participants. In this case, a common interview script is needed and should be made together. But then each group member could complete interviews on their own.

I realize that these assignments are learning experiences and you are not expected to be perfect on the first attempt. Unlike a program that you can rewrite before submission, some of the assignments may be too time consuming to redo. For example, when conducting interviews, through your interviews you may learn that you would have wanted to design your script differently. You will not be expected to change the script and redo all of the interviews. Instead each assignment will include a reflection section where your group can discuss what you learned and what you would change if you could do it again. This section will be taken into consideration when grading if it addresses misconceptions or mistakes that were made. This does not mean you should not try the first round. To have a successful project, you will want to engage fully in each assignment since it will provide insights for the next step.

Because your project builds on itself, it is important for me to be able to provide you with timely feedback throughout the semester. For each day that an **assignment is late**, the grade will be reduced by 10% of the available points. This means that if an assignment is three days late, the highest grade possible is 70%. However, I do understand that life happens. **If your group is not able to make a deadline** and you contact me at least 24 hours before the deadline, we can discuss if an extension is possible. If you contact me, I do not guarantee that you will get an extension. Also, if you contact me within 24 hours of the assignment being due or after the assignment was due, you will not get an extension.

Readings and Discussion Posts

To help prepare for class discussions, you will have assigned readings and required discussion posts. Because discussion posts will help to guide the next class discussion, they will be required to be completed by 11:59 pm before class. For example, if class is on Wednesday at 11:15 am, the posts are required to be completed by Tuesday at 11:59 pm.

For each set of reading, you will be required to make two posts. One discussion post should be a minimum of 140 words response to the reading(s). The second post can be of any length. A post can start a new thread or can be a response to what a classmate has said. The post may include a question, confusion, agreement or disagreement (with reasoning), something that surprised you, a tie to your personal experience, or a connection with previously learned material. From the discussion post, it should be clear that you

completed the readings and are engaging with the material. For some of your readings, I may give you a specific post that I want you to answer.

In-class Quizzes

We will have five quizzes throughout the semester. The timing of these quizzes can be seen on the detailed course outline. If a quiz needs to be moved for whatever reason, you will be notified in advance.

The quizzes serve two purposes: 1) to have you become familiar with the format of questions that will be asked on the exam and 2) to allow you to see where you might have misconceptions of gaps in understanding. The quizzes will not be graded (although you will receive feedback). Instead, you will receive credit for having completed the quiz.

Class Participation

In this class, the time in class is not developed to be passive. This means that you will be expected to actively participate in class activities. Class activities will change based on what we are currently discussing. Attending class will put you in a strong position to succeed. If you have to miss class, you need to let me know ahead of time or if an emergency arises, please let me know as soon as possible.

Final Exam

The only exam in this course will be the final exam. The purpose of this exam is to allow you to apply your knowledge learned throughout the semester and project. The exam will take place on November 20th, 2020 from 11 am to 1 pm.

The exam questions will be in a similar format as those from the quizzes. You may **not** use any electronic devices (including cell phones and calculators) during exams. Unless explicitly authorized in writing by the instructor, you may not receive any kind of external help on an exam.

Grading Scale

Your final grade will be based upon the above specifications. I will not curve final grades, but individual assignments/quizzes/tests may be weighted if they are found to be more difficult than expected or a chance to refine the work will be provided.

[93 - 100]	A
[90 - 93)	A-
[87 - 90)	B+
[83 - 87)	B
[80 - 83)	B-
[77 - 80)	C+
[73 - 77)	C
[70 - 73)	C-

[67 - 70)	D+
[63 - 67)	D
[60 - 63)	D-
[0 - 60)	F

Note that the upper end of each range is non-inclusive. For example, 90% would be considered an A-, not a B+.

If you are taking the pass/fail option, you must receive at least a C- to pass.

Academic Integrity

The Computer Science Department strongly promotes academic integrity. There have been cases in the past of students using (either directly or indirectly) code either from their classmates or found on the web. This is considered plagiarism and is a major violation of academic integrity.

The possible consequences of academic integrity violation include, but are not limited to: a score of 0 on the given assignment and lowering the course grade or assigning an F in the course.

Limits on Collaboration

Although collaboration is expected in this course, that does not mean you can take credit for other students' work. This includes not participating in the group assignments but still including your name as a participant or taking work from another group and passing it off as your group's work.

Also, for some assignments, you will be expected to work with participants. It can be tempting to "save time" by making fake data or findings from a participant. However, it often takes more time to fake the participant than to find someone to help. Consequences of faking the data will be a 0 on the assignment. If you have trouble finding participants, please let me know so I can help.

Disabilities and Learning Disabilities

Many students have disabilities or learning differences. It is my goal to make sure those people feel fully supported in this class. If you need special accommodations because of one of these, please reach out the Disabilities and Learning Resource Center at the beginning of the semester. They have many resources available to help manage your disability and/or learning difference. Most notably they can provide official documentation of your needs so that I can provide the appropriate resources to help you succeed in this class.

Additional Information

The last day to select the pass/fail option is October 20th. The last day to withdraw from the course *without* a W is September 10th. The last day to withdraw from the course is October 26th.

A grade of incomplete will be assigned only if there is a serious, documented reason that prevents you from completing the requirements of the course. Getting a low grade or falling behind is not a sufficient reason.

This syllabus is subject to change during the semester. The instructor will make announcements about any non-trivial changes.

Detailed Schedule

	Date	Topic	Class Preparation	Assignment Due
1	8/17/2020	Introduction & Welcome		
	8/19/2020	History of HCI	- Human Computer Interaction - brief intro By John M Carroll (through section 2.4)	Group Assignments
	8/21/2020	What is human-centered design?	- What is Human-centered design? video By Ideo - 5 Stages of the Design Thinking Process video By InVision - Chapter 1 in Design of Everyday Things By Don Norman (Blackboard)	
2	8/24/2020	Brainstorming and ideation	- Ideation for Everyday Design Challenges By Aurora Harley - Brainstorm Rules By Ideo - "Bodystorming" and "Brainstorm Graphic Organizers" in Universal Methods of Design By Bruce Hanington and Bella Martin (ebook through the library)	Assignment 0 due
	8/26/2020	Affordances and Design Metaphors	- Chapter 4 in Design of Everyday Things By Don Norman (Blackboard) - Chapters 2-3 in The Role of Metaphor in Interaction Design By Dan Saffer (Blackboard)	
	8/28/2020	Competitive Analysis	- "Competitive testing" in Universal Methods of Design By Bruce Hanington and Bella Martin (ebook through the library) - Competitive Usability Evaluations: Learning from Your Competition By Amy Schade	Assignment 1a due
3	8/31/2020	**Quiz 1**; Cognitive Biases	- You Are Not the User: The False-Consensus Effect By Raluca Budiu - 10 cognitive biases to avoid in	

			User Research (and how to avoid them) By Sundar Subramanian	
	9/2/2020	Interviews	- Section 13.2 in Interaction Design By Preece, Rogers, & Sharp (Blackboard) - Chapter 2 in About Face: The Essentials of Interaction Design By Alan Cooper, Robert Reimann, David Cronin, and Christopher Noessel (ebook through the library) - General Guidelines for Conducting Interviews By Carter McNamara	
	9/4/2020	Contextual Inquiry	- **Skim** chapter 3 and **Read** chapter 4 in Rapid Contextual Design By Karen Holtzblatt, Jessamyn Burns Wendell, and Shelley Wood (ebook through the library)	Assignment 1b due
4	9/7/2020	**Labor Day (No Class)**		
	9/9/2020	Hands-on needs finding	(No reading)	
	9/11/2020	**Quiz 2**; Qualitative Research & Analysis	- 12.6 in Interaction Design By Preece, Rogers, & Sharp (Blackboard)	
	9/12/2020	Affinity Diagramming	- Chapter 8 in Rapid Contextual Design By Karen Holtzblatt, Jessamyn Burns Wendell, and Shelley Wood (ebook through the library) - Thematic Analysis of Qualitative User Research Data By NNgroup	
5	9/14/2020	Other Diagrams	- Chapter 6 in Rapid Contextual Design By Karen Holtzblatt, Jessamyn Burns Wendell, and Shelley Wood (ebook through the library)	

	9/16/2020	User Personas	- Personas: Practice and Theory By John Pruitt and Jonathan Grudin (Blackboard)	
	9/18/2020	Storyboarding	- Storyboarding: An Empirical Determination of Best Practices and Effective Guidelines By Khai N. Truong, Gillian R. Hayes, & Gregory D. Abowd (Blackboard)	
6	9/21/2020	Video Sketches	- Video Sketches: Exploring Pervasive Computing Interaction Designs By John Zimmerman (Blackboard) - Surface Context Lens Video (Blackboard) - Don't Forget 1 (Blackboard) - Don't Forget 3 (Blackboard)	
	9/23/2020	**Group meetings with instructor (No formal class)**	(no reading)	Assignment 2 due (Thursday @11:59 pm)
	9/25/2020	**Quiz 3**; Speed dating	- Rapidly Exploring Application Design Through Speed Dating By Scott Davidoff, Min Kyung Lee, Anind K. Dey, and John Zimmerman (Blackboard)	
7	9/28/2020	Iterative Design	- What is Iterative Design? (and Why You Should Use It) By Enginess - Iterative User-Interface Design By Jakob Nielsen (Blackboard)	
	9/30/2020	Introduction to Prototyping	- Chapter 14 in Sketching User Experiences: Getting the Design Right and the Right Design by Bill Buxton (ebook through the library)	
	10/02/2020	Lo-fi Prototyping	- Prototyping for Tiny Fingers By Marc Rettig (Blackboard) - Chapter 35 in Sketching User Experiences: Getting the Design Right and the Right Design by Bill Buxton (ebook through the	Assignment 3 due

			library)	
8	10/05/2020	Lo-fi Prototyping cont.	(No reading)	
	10/07/2020	Introduction to Usability Testing	- Usability Testing (through page 7) By James Lewis (Blackboard) - Some Techniques for Observing Users By Kathleen Gomoll (Blackboard) - Task Design Methodology in Usability Testing in Singapore	
	10/09/2020	*P1*, Think Aloud	- Section 6.3 in Sketching User Experiences: the Workbook By Saul Greenberg, Bill Buxton, Sheelagh Carpendale, and Nicolai Marquardt (ebook through the library)	
9	10/12/2020	*P2*, Information Architecture & Wireframing	- An Excellent Beginner's Guide To Information Architecture By Pia Klancar - Designing for Mobile, Part 1: Information Architecture By Elaine McVicar	
	10/14/2020	Information Architecture & Wireframing cont.	(No reading)	
	10/16/2020	*P3*, Hi-fi Prototyping	- Chapter 8 in Interaction Design By Preece, Rogers, & Sharp (Blackboard)	
10	10/19/2020	*P4*, Hi-fi Prototyping cont.	(No reading)	Assignment 5
	10/21/2020	**Quiz 4**; Hi-fi Prototyping cont.	(No reading)	
	10/23/2020	Design Heuristics	- 10 Usability Heuristics for User Interface Design By Jakob Nielsen - 10 Heuristics Playlist	

11	10/26/2020	*P5*, Design Language	- [What is a Design Language… really?](#) By Nate Baldwin	
	10/28/2020	Design Patterns	- The Anatomy of HCI Design Patterns By Christian Kruschitz and Martin Hitz (Blackboard) - Look through… [UI Patterns](#) [Android Patterns](#) [Apple Patterns](#)	
	10/30/2020	*P6*, Wizard of Oz	- Section 6.2 in Sketching User Experiences: the Workbook By Saul Greenberg, Bill Buxton, Sheelagh Carpendale, and Nicolai Marquardt (ebook through the library)	
12	11/02/2020	*P7*, Participatory Design	- "Participatory Design" in Universal Methods of Design By Bruce Hanington and Bella Martin (ebook through the library) - The Method of Participatory Design By Clay Spinuzzi (Blackboard)	
	11/04/2020	Cognitive Walkthrough	- [Cognitive Walkthroughs](#) By Brad Dalrymple - [The 4 questions to ask in a cognitive walkthrough](#) By David Travis	
	11/06/2020	**Quiz 5;** Heuristic Evaluation	- [How to Conduct a Heuristic Evaluation](#) By Jakob Nielsen	Assignment 6a due
13	11/09/2020	Test Prep & Presentations		
	11/11/2020	Test Prep & Presentations		
	11/13/2020	Test Prep & Presentations		Assignment 6b due
Finals	11/20/2020	11 am - 1 pm		