

# User-Centered Innovation | spring 2015 | V1

**Instructor:** Shimon Shmueli, [shimon@pdx.edu](mailto:shimon@pdx.edu)  
**TA/GSA:** TBA  
**Time:** Wed, 18:00-21:40  
**Location:** South (OIT Campus), 27500 Southwest Parkway Ave., Wilsonville, OR 97070  
*We will organize transportation between PSU and Wilsonville.*  
**Office hours:** Please coordinate ahead of time.  
**Updates:** This syllabus will be updated with appropriate highlights and notifications.

## Course Description

Between 1996 and 2001, Lockheed Martin and Boeing competed on the engineering and manufacturing of what is now known as the F-35 Joint Strike Fighter. Lockheed Martin won the competition, which was well documented by PBS. What roles did user-centered design and technology innovation play in the design of the competing jetfighters? Did the aesthetics of the F-35 play any role in that competition? If so, what was it and what are some of the human aspects behind it? What is the role of aesthetics in electronic games design and how far should we push realism in computer graphics? What is common between Sony Aibo and DARPA’s Legged Squad Support System and what does Google have to do with it?

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*“The real voyage of discovery consists, not in seeking new landscapes, but in having new eyes.”*

Marcel Proust

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These are examples of some questions we will ask ourselves throughout this course. These are the types of questions managers ask themselves in a hyper-competitive business environment where often there is no room for more than one or two winners, and products are increasingly differentiated by intangible attributes.

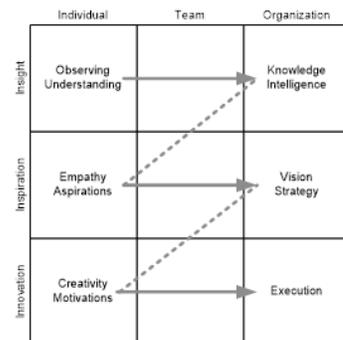
This graduate course introduces students to various approaches, methodologies, and most importantly to underlying human and organizational factors in user-centered design and innovation, sometimes referred to as Design Thinking. We will put together a framework of insights, inspiration, and innovation, and explore each of its components. We will also introduce students to the increasingly prominent role of design in creating memorable experiences, and emotional connections with a product and/or the brands behind them. Students will learn how to identify opportunities, transform these opportunities into requirements and product concepts that cast an optimum balance between feasibility, viability, and desirability. We will try to reflect, feel, empathize, listen, brainstorm, collaborate, excite, get excited, and engage in some of the activities that are considered essential as part of the development of successful products from all stakeholders’ perspectives. We will study success and failure cases, do a semester-long project, and will enjoy perspectives of some industry thought leaders through readings, videos, and in-class visits.

## Course Objectives

The objectives of the course are along two dimensions: individuals leading teams and organizations through market/user insights, inspiration, and innovation. In this course we will attempt to enhance the capabilities of E&T managers in each of the intersections. This is a very ambitious goal that will be mostly achieved by teaching foundations and increasing awareness and motivation for lifetime of learning.

At the end of the term, students should be able to:

- Understand and appreciate the diversity of roles, disciplines, and mindsets in cross-disciplinary teams that are vital to bringing to market successful products.



- Understand the broad ideas and issues related to creativity and innovation, the user-centered approach, and the relationships among them.
- Use and deploy basic user insights and innovation methods and successfully recruit other resources to further develop those capabilities within organizations.
- Be an advocate of the user-centered approach and contribute to organizational cultures and processes.
- Most importantly, join the world-wide exchange, thinking, and practices towards better meeting of human needs through engineering and technology management.

### Approach

While we will cover a lot of material through readings and class discussions, the most important aspects of this class is the value you will gain from hands-on experience in interacting with your team conducting the project and being an engaged participant in class discussions.

### Required Textbooks, Software, Etc.

1. Textbook: Norman, Don. *The Design of Everyday Things: Revised and Expanded Edition* (DE)
2. Objectified documentary available at [goo.gl/gGQ3fD](http://goo.gl/gGQ3fD) or Netflix
3. Download and install XMind (free version) at [www.xmind.net](http://www.xmind.net)

Additional reading materials will be posted on D2L.

### Individual Deliverables

#### Observations

Throughout the semester students will write three Observations.

Observations must be about a current or past personal experience with a product or a service. You will describe the situation from your own perspective and then expand and generalize beyond your own experience by literature research. I expect you to read 2-3 scientific articles and summarize the findings that are applicable to your own experience. You may focus on only one topic (e.g. use of materials for emotions) and go deep with surveying 2-3 literature sources or highlight a few topics and support each with one literature source. Please limit articles only to available through the PSU Library website.

Observation paper is expected to be about 2-3 pages long. Make sure you include appropriate article citations.

You will present your observation and the related literature summary in class and have a short discussion for a total of 20 minutes. Submit PowerPoint presentation and Word paper by 2:00 p.m. on the day you present.

Presentation days are listed in the Schedule & Assignments section below.

#### Briefs

During the quarter students will submit 10 briefs on reading material. In each brief you should write your own takeaways in one paragraph and 2-3 questions/issues you would like to discuss in class. Be prepared to discuss the brief in class and facilitate a short 5-10 min. class discussion based on your questions/issues.

### Team Project

During the quarter teams of students will conduct a project on a theme selected by instructor. The project will follow the Double Diamond process and will result in a product concept.

At the end of the quarter teams will present their projects through the following deliverables:

**Problem Definition**

This is a *design brief* that communicates the right problem to be solved. It will describe:

- Users described with the aid of personas
- Main problem to be solved
- Touch points
- Solution scope
- Objectives and success criteria

Limit to 12-15 pages of PowerPoint presentation.

**Final Presentation**

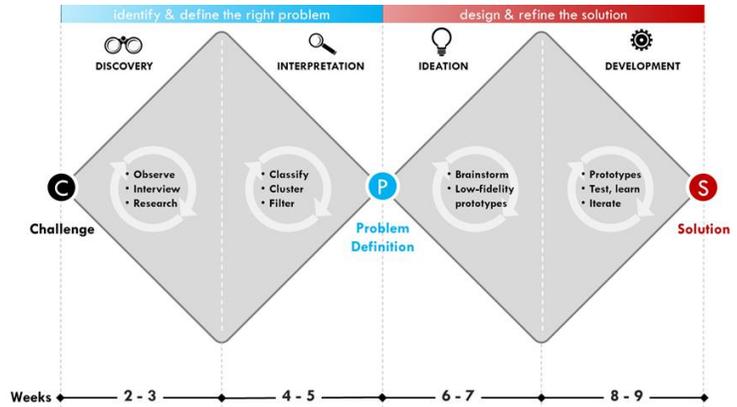
The final project presentation will have two parts: process and solution.

*Process Section:*

A summary of the process your team went through is often conveyed through *process diagrams, flow charts*, and examples of *raw material* such as field notes and pictures, pictures of your team in action, etc. Additional section will list key *lessons learned* about the process used. This is the poster that will include the team’s divergences in ideas and the converging processes to communicate to the viewer how the team functions and succeeds together.

*Solution Section:*

The Solution Poster focuses on a summary of the *solution* proposed solution and *how it is used*. This should include prototypes, mock-ups, use diagrams, story-boards, and validation that this solution successfully addresses the problem definition delivered in week 5.



Schedule & Assignments (tentative)

<b>INTRO</b>	<b>Week 1</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Introductions</li> <li>• Syllabus Walkthrough</li> </ul>	<u>Preparation</u> Watch: <a href="#">Do schools kill creativity?</a> Read: this syllabus
<b>DISCOVER</b> 	<b>Week 2</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• The design process</li> <li>• Insights &amp; ethnographic research</li> </ul>	<u>Preparation</u> Read: DE 1
	<b>Week 3</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Intro to design: role in innovation and NPD, art vs. design</li> </ul>	<u>Preparation</u> Read: DE 2
<b>INTERPRET</b> 	<b>Week 4</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Systems thinking</li> </ul>	<u>Preparation</u> Read: DE 3
	<b>Week 5</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Design for experience</li> <li>• Mental models and perception</li> </ul>	<u>Preparation</u> Read: DE 4

<b>IDEATE</b>  	<b>Week 6</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Problem Definition presentation</li> <li>• Creativity</li> <li>• Systematic innovation</li> </ul>	<u>Preparation</u> Deliverable: Problem Definition Read: DE5
	<b>Week 7</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Personas &amp; scenarios</li> <li>• Story telling in creativity and design</li> </ul>	<u>Preparation</u> Read: DE 6
<b>DEVELOP</b>  	<b>Week 8</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Prototyping</li> <li>• Convergence tools</li> </ul>	<u>Preparation</u> Read: DE 7
	<b>Week 9</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Aesthetics in design</li> <li>• Design Thinking</li> </ul>	<u>Preparation</u> TBA
<b>REFLECT</b>	<b>Week 10</b>	
	<u>Agenda</u> <ul style="list-style-type: none"> <li>• Project presentations &amp; reflections</li> </ul>	<u>Preparation</u> Deliverables: project presentation

***Have Fun!***

## Class Policies

**Gadgets:** Use of laptops for course related purposes only is allowed only when notified. Use of phones is allowed only for urgent messages. You may take pictures with your phones during class, but do not share anything on any media without the appropriate permissions.

**Attendance & Participation:** You are expected to attend and actively participate in all sessions.

**Ethics & Collaboration:** Collaboration among course students and teams is encouraged with work related to team projects. Violation of academic honesty with respect to individual work and deliverables will not be tolerated. Please review [Policies & Codes of Conduct at PSU](#).

**Written Materials:** Use standard fonts (e.g. Arial, Calibri, Times New Roman) of 10 points, single space, 1" margins, and numbered pages. Only MS Word documents will be accepted.

**Desire2Learn:** Log into [d2l.pdx.edu](http://d2l.pdx.edu) using your ODIN name and password. We will use D2L for submissions via drop boxes<sup>1</sup>, grade posting, and distribution of additional reading materials. Please make sure to:

- Set up notifications via email and/or SMS.
- Upload a picture and add some personal information.

## Grading

Grades will be updated and visible on D2L throughout the quarter.

It is your responsibility to call our attention to discrepancies within 2 weeks from the time a grade is posted on D2L. I will not revisit grades at the end of the quarter.

	Deliverable	Weight %	Grading Type
<b>Individual</b> 70 points	Class Attendance & Engagement:	20	0, 7, 8, 9, 10
	Observation #1:	10	0...100
	Observation #2:	10	0...100
	Observation #3:	10	0...100
	Briefs:	20	0...100
<b>Project</b> 30 points	Problem Definition:	10	0...100
	Process Presentation:	10	0...100
	Solution Presentation:	5	0...100
	Prototypes and Discovery Materials:	5	0...100

Deliverables will be rated as: 1 (poor), 2 (fair), 3 (good), 4 (very good)

Attendance will be rated as: 0 (unjustified nonattendance), 7 (poor or justified nonattendance), 8 (fair), 9 (good), 10 (very good)

Throughout the quarter grading will be based on a 0-100 points scale and at the end will be converted to Differentiated A-F scale.

<sup>1</sup> Only D2L drop box submissions will be accepted.