

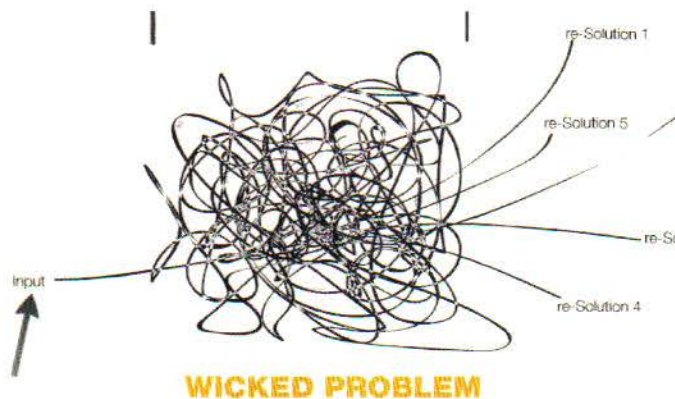


A46 ARCH 376
fall 2012, 1 credit
W, 12:00-1:00
Bruce Lindsey
blindsey@wustl.edu
108 Givens Hall
office 314-935-4636
cell 314-799-8116

Design Thinking^{for}

Science, Engineering, Business, Liberal Arts

RESEARCH PROJECT



Identify a Wicked Problem within your disciplinary field i.e. architecture, anthropology, engineering etc. Define the Wicked Problem as a Design Problem and speculate about a possible Design Solution. Present your work in a one page white paper. Try to be as explicit as you can. Try to be as innovative as you can. in speculating about the solution. You may steal any good idea that sheds light on the problem or informs a possible solution, just cite your source. Picasso said, "good artists borrow, great artists steal."

We will use the papers as a point of departure for discussions about the intersection of these problems across disciplines. These discussions will happen in-class Nov. 7 and Nov. 14. Be prepared to contribute to the discussion as I will be calling on you.

Email me a pdf of the white paper by **6am Monday Nov. 5**. Please place "white paper" in the subject line of the email. I will distribute all white papers to all students on Monday so that you may review them before our discussions.

I want to incite discussion about what design thinking means, and doesn't mean in your disciplines. We will figure out where to go from there.



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Easy Company Tea

Rising bread (a) pushes springed pipe (b) against balancing board (c) forcing heavy bowling ball (d) to roll onto board (e) forcing the spring of basketball (f) to push up on wood handle (g) on oven thermometer (h) causing oven to turn on and bake bread. Handle (g) is helped up by weight (i) which has control of the spring. Weight (i) pushes on alarm clock (j) and is set for 50 minutes. After 50 minutes alarm is rung and alarm spring pops knob (k) put of top, pushing weight (i) into air letting handle (g) swing down to turn off oven (b) and hit button (l) to let oven door (m) open allowing bread to cool. At the same time the alarm rings a mouse's tail (n) is freed. The mouse follows his senses to cheese (o) in trap (p). The springs of the trap hit board (q) causing it to spring up and pull with it handle (r) attached to stove burner (s) and turn on burner (t) heating water (u) for tea. The whistle in turn will notify baker of warm bread and tea for company.

Make a drawing in your sketchbook of the above description. Label the parts; a. b. etc.

Bring a xerox copy to class on Sept. 12



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DESIGN PROJECT ONE

Design a pencil. Manufacturer enough pencils for each member of the class. The pencil should be practical, useful, durable, economical, and beautiful.

Your design team should use the method of thirds for organizing the design and construction process. The method of thirds is as follows:

1. Determine the amount of time from start to finish, in this case from today until class time Oct. 17.
2. Divide the time in thirds.
3. Spend the first 1/3 of your time brainstorming, such that you come up with three possible ideas.
4. Spend the second third of your time developing the three ideas in a way that allows you to choose one for manufacturer.
5. Spend the remaining time manufacturing your pencil.
6. Make and edit a 60 second video of the process of design outlining the significant strategies of the project.
7. Post the video to youtube. Email me the link by class time Oct. 17.



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COURSE DESCRIPTION: This introductory course will outline strategies and methodologies drawn from a wide range of creative design practices including architecture, landscape architecture, urban design, industrial design, and others. The course will explore how these ideas and techniques are similar to practices in science, engineering, business and the liberal arts and how they might be applicable to multidisciplinary problem solving. Topics will include perception, representation, technology, group intelligence, bio-mimicry, and context based learning among others. Emphasis will be given to the intersection of design thinking with environmental problems and the relationship between design thinking and innovation. The course will include lectures, guest lectures with case studies, and design projects. Open to all undergraduate students.

COURSE OBJECTIVES

- gain an understanding of design and design processes
- explore interdisciplinary applications of design thinking
- gain experience (practice) in designing

COURSE GOALS

Habits of mind:

- ignite the curious mind
- develop fluid and critical thinking
- incite substantiated and open positions (a point of view)

Habits of work:

- work done daily
- organized persistence
- reliance on colleagues for an emergent ecology of production
- speed

Skills:

- visualization
- building and prototyping
- recording

At the conclusion of this class the student should be able to offer a definition of design, articulate design in the context of a design process, and speculate on the applicability of design to science, business, engineering, and the liberal arts.



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CALENDAR: Fall 2012

DESIGN

1	August 29	Lecture: Define Design
2	Sept. 5	Lecture: Thinking & Drawing II
3	Sept. 12	Lecture: Design & Perception
4	Sept. 19	Lecture: Design Problems/Solutions/Process
5	Sept. 26	Guest Lecture: Catalina Frexias, Bio-mimicry

Design Process

6	Oct. 3	Guest Lecture: Sam Chun, Olin School
7	Oct. 10	Guest Lecture: Robert Morgan, set designer sketch book review
8	Oct. 17	Project I due
9	Oct. 24	Guest Lecture: Amos Harris, Spinaker STL
10	Oct. 31	Guest Lecture: Brice Rutter, MetaPhase

Design Thinking

11	Nov. 7	Project working session
12	Nov. 14	Project working session
13	Nov. 21	Thanksgiving
14	Nov. 28	Project presentations
15	Dec. 5	Project presentations sketch book review

Please note: The professor reserves the right to change the schedule at any time.



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COURSE METHOD / ORGANIZATION

This course will include lectures, guest lectures, discussions, and two collaborative design projects. We will also learn about design and design thinking by designing. This is a one credit class and every effort will be made to ensure that the time required is appropriate. Expectations are that no more than two hours each week outside of class will be required. The course will be organized in thirds. The first third will be around the topic of design, the second third design process, and the last third design thinking.

LECTURE

Lectures begin promptly at 12:10 in Givens 113 and end promptly at 1:00. Attendance is required.

READINGS

We will periodically have readings which will be available online. A course bibliography for supplemental reading is included with this syllabus.

SKETCH BOOK

The sketch book will chronicle your class notes, and the development of your understanding and point of view. It will be reviewed at mid-term Oct. 10 and at the end of the semester Dec. 5. It should represent the extent of your curiosity related to the content of the course. The development of the solution to the two design projects should be represented in your sketchbook.

DESIGN PROJECTS

There will be two design projects. The first will be discrete. The second will be hairy. The design projects will be done in groups. There will be different groups for each project.

DISCUSSION AND PARTICIPATION

Discussion and participation in class and in your design groups is required. You will benefit from the participation of your colleagues and will be expected to return that favor. It is extremely selfish to just listen.

FINAL EXAM

You will not have a final exam in this course.

All University policies of attendance, disclosure, and conduct apply.



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EXPECTATIONS

Your grade will be based on the following:

Attendance / participation	35%
-10% for every absence after one	
Design project 1	25%
Design Project 2	25%
Sketch Book	25%
Total	110%

The following standards will be used in assigning grades:

A Exemplary work, which is attended with initiative beyond the description of the stated problem. Work which makes evident a significant understanding of the problem, shows competence in the required skills, and exhibits a conceptual clarity and depth. Is attended by an attitude of exploration, of open-mindedness, and a willingness to benefit from criticism.

B Some exemplary work which shows an understanding of the problem, displays a conceptual foundation and is well crafted. Shows competence and mastery of skills. Is attended with an open and inquisitive attitude.

C Adequate work which meets the minimum requirements of the problem and course. Shows an understanding of the problem while acknowledging some deficiencies. Shows a reasonable mastery of skills and concepts. This grade is seen to represent the average solution and therefore will be the most prevalent.

D Work, which although complete, does not show an understanding of the problem, and demonstrates deficiencies in the mastery of skills. This work can often be attended with a belligerent or close-minded attitude particularly with respect to criticism and self-motivation.

F Failing work which does not meet the requirements of the problem or course, shows a serious deficiency in the mastery of skills.

No in completes will be considered unless warranted by external circumstances.



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READING LIST

- Perkins, D. N. **The Mind's Best Work.** Cambridge, MA: Harvard University Press, 1981.
- John-Steiner, Vera. **Notebooks of the Mind: Explorations of Thinking.** New York, NY: Harper & Row, 1987.
- Rowe, Peter G. **Design Thinking.** Cambridge, MA: The MIT Press, 1987.
- Lawson, Bryan. **How Designers Think: The Design Process Demystified.** Oxford: Butterworth Architecture, 1988.
- Lawson, Bryan. **What Designers Know.** Oxford: Architectural Press, 2006.
- Potter, Norman. **What is a Designer: things, places, messages.** London: Hyphen Press, 1989.
- Schon, Donald A. **The Reflective Practitioner: How Professionals Think in Action.** New York, NY: HarperCollins, 1983.
- Simon, Herbert A. **The Sciences of the Artificial.** Cambridge, MA: The MIT Press, 1981.
- Grudin, Robert. **Grace of Great Things Creativity and Innovation.** New York: Ticknor & Fields, 1990.
- Sawyer, Keith. **Group Genius The Creative Power of Collaboration.** New York: Basic Books, 2007.
- Brown, Tim. **Change By Design How Design Thinking Transforms Organizations and Inspires Innovation.** New York: Harper Collins, 2009.
- Kelley, Tom, Jonathan Littman, Tom Peters, Tom Peters. **The Art of Innovation : Lessons in Creativity from IDEO, America's Leading Design Firm.** , 2001.
- Mau, Bruce, Institute without Boundaries, Jennifer Leonard. **Massive Change.** Phaidon Press, 2004.
- Design and the Elastic Mind.** New York City : Museum of Modern Art, 2008.
- Pye, David. **The Nature & Aesthetics of Design.** Bethel CT: Cambium Press, 1978.
- Petroski, Henry. **The Pencil: A History of Design and Circumstance.** New York, NY: Alfred A. Knopf, 1992.
- Barratt, Krome. **Logic and Design: In Art, Science and Mathematics.** New York, NY: Design Press, 1980.
- Caplan, Ralph. **By Design.** New York: St Martins, 1982.
- Papanek, Victor. **The Green Imperative, Natural Design For the Real World.** New York: Thames & Hudson, 1995.