CEP 917

CEP 917 Knowledge Media Design

Please note: Provided as a sample only

Syllabus
C E P 9 1 7 F 0 8: K N O W L E D G E | M E D I A | D E S I G N

Design is not for philosophy, it's for life — Issey Miyake

Schedule
Tuesdays, 4:10 ~ 7:00 pm
128 Erickson Hall
Class website:
Class listserv: cep917fall08@googlegroups.com

Instructor
Dr. Punya Mishra (punya@msu.edu)
Office Hours: by appointment, 509A Erickson Hall

> *The ideal designer is a composite ... he is not a scientist, he is not a mathematician, he is not a sociologist, or a writer; but he may use the knowledge and techniques of any or all of these disciplines in solving design problems — N. W. Dougherty*

Introduction
This course is about design. Design as a way of thinking, working and learning about and with technology. Design is both a noun & a verb—a product as well as a process. Design is involved in the construction of any artifact, be it a web site or a car; a poem or a research project.

Design lies in an area that touches upon a variety of disciplines—science, technology, engineering, psychology, art to name just a few. It is this multi-dimensionality that makes the act and process of design so important and so complex. Nowhere is understanding design more important than in the realm of educational technology—where we try to bring the logic of technology to the world of learners and their minds.

Design is increasingly becoming of interest to educational scholars. However, we know little about what happens when we do design. What kinds of knowledge do designers need? How does this knowledge differ from other kinds of knowledge? Where do new ideas come from? Which ideas survive and which don't, and why? What is learned from design, if anything? What role does technology play in design? How do users respond to artifacts we create? How can we recognize good designs from bad ones? What role does aesthetics play in the design process and in the user experience? What happens to the designed artifact once it leaves the designer's desktop and enters the wider world? These are just some of the questions that we will be exploring through the semester.

A multi-dimensional issue like design requires us to tackle it in a multifaceted way. So we will be dong many different things this semester. We will read a wide range of research and theory articles. We will discuss these articles (both in class and on the discussion board). We will learn to appreciate design-quality by sharing and discussing examples of good and bad design in the world around us. We will also be involved in the analysis of some real video data of children involved in design activities. There is the potential for some real publications or conference presentations here and more importantly the opportunity to engage in some real research. More details will be available in an additional document.

Readings
There are no assigned books for this class. Readings will be available electronically, either as Web (html) documents or as pdf documents. I have an immense range of books and articles on design and reserve the right to change the readings as the course progresses and our interests get more focused (or more diffuse, as the case may be).

What are we going to do this semester?
A typical class meeting will involve some reading and discussion about the reading (both in and out of class). The schedule of reading will be posted on the course web site. Tentatively, each face-to-face class meeting will consist of:

* Housekeeping (10 - 15 minutes)
* Open discussion based on the readings and the activity (1 hour)
* Short activity (optional) and examples of good and bad design (30 minutes)
* Updates on group projects and individual projects (15 minutes)
* Working in groups on projects (remaining time)

There are two aspects to design and creativity. The first is learning to see and the second is bringing everything together in the process of creating something new. The assignments in this class will attempt to cover each of these.

Assignments
There are four assignments that you will complete in this class, details given below. We will complete these assignments one at a time (in sequence). This is to prevent having to complete them in a rush at the end of the semester. Deadlines for each of these assignments will be decided in class (and will be posted to the course website).

Assignment I: Understanding the social life of things.
We interact with artifacts all the time. They give your lives meaning and shape. In this assignment your task is to identify one artifact, it could be a physical object or an institution or a place. Over time observe, and through that understand how you make meaning of this artifact.

The first task in this regard is to define your unit: is it a classroom, a website, the food court, the book, shoes, doors, shopping cart, a superstore, or the idea of jewelery, or scrapbooks that people maintain. You could choose a specific group (say students in special education, or teachers) and look at the kinds of artifacts they use, how the customize it for their own purposes.

I am leaving this open for us to discuss and think how we would like this project to go. Some of the readings in the first few weeks will touch on this.

The final product for this assignment will be a short photo essay that documents (a) the artifact you tried to understand; (b) a documentation of what you found; and (c) an interpretative conclusion that helps us understand what it is that you found. You could create this photo-essay on Flickr using the description below to explain what it is that you found out.

Starts September 2 - Due October 7

Assignment II: On constructing an educational technology
Most technologies are not designed for educational purposes. What this means is that technologies have to be creatively repurposed in order to make them fulfil their educational potential. This is as true of Microsoft Excel as it is of the iPhone. In this assignment we will work together to take some simple tools (such as an iTouch or a Flip Video camera) and come up with simple, powerful uses for them in educational settings.

Starts September 16 - Due October 21

Assignment III: Understanding design, Snapshots of the process
This is a group assignment. In this assignment you will work with your group to document the process by which someone designs something. This could be a web-designer or a poet, a graphic artist or an architect. You will typically videotape them working on a ill-structured, open-ended problem and track the process they take in developing their solution. You will complement this with an interview with the designer where they explain how they go about problem solving in their domain. The role of representations, aesthetics, planning and foresight, and serendipity are some of the aspects of the design process you will examine. You will finally create a short video that explains what you learned.

Starts September 2 - Due November 25

Assignment IV: Final paper on Knowledge, Media, Design
At the end of the semester you will write and submit a 10 page paper on what you have learned in this class and the implications it has for your role as a professional.

Starts September 2 - Due at the end of the semester

I will provide specific details on each of these assignments during class.

Individual Responsibilities
Since this is a doctoral seminar I expect a lot from each of you (and from myself). I expect each and every one of us to read the articles/ chapters/ papers assigned and to think deeply about them. I expect each of you to work well with your assigned groups. Group work can sometimes be difficult, but not when each and every individual is contributing to the overall goal, is open to others ideas, and is willing to both lead and follow as and when needed.

Individual responsibility I: Class participation.
I expect each of us to participate in in-class discussions. There is no requirement for online discussion - however each of you has to submit questions related to the readings to the class listserv (googlegroup) by Sunday evening. You are not required to further discuss these questions / readings - but you are free to do so if you feel like it. I do expect each of you to complete the readings and review the postings made by the others prior to the class meeting. I expect engagement with the ideas, independent research on the issues, an open yet critical perspective on what we discuss.

Individual responsibility II: Developing discussion questions
Before class: Each of you will develop a set of discussion questions based on the readings and email them to the class listserv by Sunday evening. There isn't a requirement for online discussions though it is encouraged. I (the instructor) will use the questions posted to develop a set of discussion points for the face to face meeting.

Individual responsibility III: Understanding the social life of things, on making an ed tech & final paper
See above

Group Responsibilities
On the second day of class we will break up into 3 or 4 groups. These groups will last through the semester. Your input will be considered, though I will have the final say in how they are constituted. The groups will have two main responsibilities:

Group Responsibility I: Design and creativity activities
Each group will devise a brief classroom activity (20-30 minutes long) that either (a) allow us to reflect on the issues being raised that week in the readings; or (b) allow us to explore the current assignment. Be as creative as you can in developing this activity. The activity should be fun yet thought provoking, and you will be responsible for conducting the activity. I will be available as a consultant to help you think about this.

Finally, the group will send a summary of the activity (with any artifacts produced or assignments handed out) to me to be included in the class website.

Group Responsibility II: Examples of good/bad design or creativity
Finally, the group will also bring to class some examples of good and bad design / creativity they have encountered in their lives. Each member of the group is to share at least one example, providing reasons why this is an example of good/bad design or creativity. These examples should be from the world around you, not found through a web search.

The group in charge will email the good and bad design examples to me to be included in the web site. You can send me images with a brief description of what made the artifact an example of good or bad design/creativity.

Group Responsibility II: Understanding design, snapshots of the process
See above.

Grading

The final grade for the course will depend on

Participation, online and face to face (Individual): 15%
    (The emphasis is on quality of participation.)
Group design project: 40%
Individual, social life of artifacts project: 30%
Group Work: 15%
    (Design of classroom activity etc.)

Calendar

August 26
Introduction to course, website, syllabus, discussion group etc. etc.

September 2
Introduction to design (Simon, Shapin, Mishra et. al.)

   Main dishes
   Simon, H. A. (1996). The sciences of the artificial. Cambridge, MA: MIT Press. [Chapter 1: Understanding the
          natural and artificial worlds & Chapter 5: The science of design: Creating the artificial] [PDF]
   Shapin, S. (May, 2007). What else is new? How uses, not innovations, drive human technology. New Yorker.
          [HTML]
   Mishra, P., Yong, Z., & Tan, S. (1999). From concept to software: Developing a framework for understanding
          the process of software design. Journal of Computing in Educational Research. 32(3). 220-238. [PDF]

   Side dishes
   Margolin, V. (2002). The politics of the artificial. Chicago: University of Chicago Press. [Chapter ?: The two
          Herberts]
   Maximizing windows @ http://www.asktog.com/columns/000maxscrns.html
   Edge.org discussion of "The most important invention in the past 2000 years."[HTML]

September 9
Our relationships to everyday things (Csikzentmihalyi, Norman)

       Main dishes
   Csikszentmihalyi, M., & Rochbert-Halton, E. (1981). The meaning of things: Domestic symbols and the self.
          Cambridge, MA: Cambridge University Press. [Chapter 1: People and things | Chapter 2: What things are
          for | Chapter 7: The transactions between persons and things]
   Boradkar, P. 10,000 songs in your pocket & Sphere Factor [Author's website]

       Side dishes
   Norman, D. A. (1988). The psychology of everyday things. New York: Basic Books. [Chapter 1: The
          psychopathology of everyday things; Chapter 7: User-centered design]
   Latour, B. (2000). Where are the missing masses? The sociology of a few mundane artifacts. In In W. E. Bijker
          & J. Law (Eds.) Shaping technology / building society: Studies in sociotechnical change. Cambridge, MA:
          MIT Press. P. 225 – 258).
   Petroksi, H. (1992). The evolution of useful things. New York: Vintage Books. [Chapter 1: How the fork got its
          tines, p. 3 – 21; Chapter 2: Form follows failure; p, 23 – 33; Chapter 8: Patterns of proliferation, p. 131 –
          153; Chapter 14: Always room for improvement, p. 237 – 250]
   Buckley, C. (1989). Made in patriarchy: Towards a feminist analysis of women and design. Margolin, V. (Ed.).
          Design discourse: History, Theory, Criticism. Chicago: University of Chicago Press.

September 16
Evolutionary approaches to technology, biological/cultural (Casler, Pinker, Basalla, Diamond)

       Submit 1 page description of your individual project

Main dishes

Basalla, G. (1988). The evolution of technology. Cambridge UK: Cambridge University Press. [Chapter 1: Diversity, necessity, and evolution. P. 1 – 26 | Chapter 7: Conclusion: Evolution and progress, p. 207 – 218.

Diamond, J. (1986). Guns, Germs & Steel: The fates of human societies. New York: W. W. Norton. Chapter 13: Necessity's mother.

Miller, G. F. (1999). Waste is good. Prospect, Feb., pp. 18-23.

Side dishes

Casler, Krista & Kelemen, Deborah (2005). Young children's rapid learning about artifacts. Developmental Science 8 (6), 472-480.

Kelemen, D. (1999). Functions, goals and intentions: Children's teleological reason about objects. Trends in Cognitive Sciences, 3 (12), 461-468.

Pinker, S. (1996). How the mind works. Read 314-333 in the chapter "Good Ideas".

Santos, L.R., Hauser, M.D., & Spelke, E.S. (2001). The representation of different domains of knowledge in human and non-human primates: Artifactual and food kinds. In M. Beckoff, C. Allen, and G. Burghardt (Eds.), The Cognitive Animal. Cambridge: MIT Press.

September 23
Design process, how do we design? (Schon, Turkle, Norman)

Main dishes

Lowgren, J. & Stolterman, E. (2004). Thoughtful Interaction Design: A design perspective on information technology. MIT Press. [Chapter 3: The designer]

Schon, D. A. (1983). The reflective practitioner: How professionals think in action. New York: Basic Books. [Chapter 3: Design as a reflective conversation with the situation]

Turkle, S. (1995). Life on the screen: Identity in the age of the Internet. New York: Simon & Schuster. [Chapter 1: A tale of two aesthetics]

September 30
How do we design II

Main dishes

Cross, N. (2006). Designerly Ways of Knowing. Springer. [Chapter 4: Creative Cognition in Design I: The Creative Leap | Chapter 5: Creative Cognition in Design II: Creative Strategies | Chapter 6: Understanding Design Cognition].

Turkle, S., & Papert, S. (????). Epistemological Pluralism and the Revaluation of the Concrete. Available online here, or download PDF here.

October 7
Defining creativity (Assignment I, due)

Main dishes

Csikszentmihalyi, M. (1996). Creativity: Flow and the psychology of discovery and invention. New York: Harper Collins. [Chapter 2: Where is creativity?].

O'Quin, K., Besemer, S. P. (1989). The development, reliability, and validity of the revised creative product semantic scale. Creativity Research Journal. 2. 267-279. [Not the whole article, focus on the dimensions and the words they use to define these dimensions]

LeGuin, U. K. (1989). Where do you get your ideas from. In Dancing at the edge of the world: Thoughts on words, women, places. New York, NY: Harper & Row Publishers.

October 14*
No class

October 21
The work of creativity (Assignment II, due)

Main dishes

Hofstadter, D. R. (1985). Variations on a theme as the crux of creativity. (pp. 232-259)In D.R.Hofstadter (Ed.). Metamagical Themas: Questing for the essence of mind and pattern. New York: Basic Books.

Csikszentmihalyi, M. (1996). Creativity: Flow and the psychology of discovery and invention. New York: Harper Collins. [Chapter 4: The work of creativity]

Kelley, T., & Littman, J. (2001). The art of innovation: Lessons in creativity from IDEO, America's leading design firm. New York, NY: Random House. [Chapter 1: Innovation at the top | Chapter 3: Innovation begins with an eye].

Amabile, T. M. (1998). How to kill creativity. Harvard Business Review. 76(5)

October 28
Individual Creativity

Main course

Csikszentmihalyi, M. (1996). Creativity: Flow and the psychology of discovery and invention. New York: Harper Collins. [Chapter 14: Enhancing personal creativity].

Root-Bernstein, R., & Root-Bernstein, M. (1999). Sparks of genius: The thirteen thinking tools of the world's most creative people. [Chapter 2: Schooling the imagination | Chapter 16: Synthesizing education]. Houghton Mifflin Company: Boston.

Side dishes

Postrel, V. (2003). The substance of style. New York: Harper Collins. [Chapter 1: The aesthetic imperative]

Adams, C. C. (1995). Technological Allusivity: Appreciating and Teaching the Role of Aesthetics in Engineering Design. In D. Budny, R. Herrick, G. Bjedov, & J. B. Perry (Eds.). Proceedings of 1995 ASEE/ IEEE Frontiers in Education 95 Conference. Atlanta, GA.

Root-Bernstein, R., & Root-Bernstein, M. (1999). Sparks of genius: The thirteen thinking tools of the world's most creative people. [Chapter 1: Rethinking thinking | Chapter 13: Playing]. Houghton Mifflin Company: Boston.

Sternberg, R. J. (2003). Wisdom, Intelligence and Creativity synthesized. [Chapter 7: Balance theory of wisdom]. Cambridge, MA: Cambridge University Press.

Csikszentmihalyi, M., & Robinson, R. E. (1990). The art of seeing: An interpretation of the aesthetic encounter. Los Angeles, CA: J. Paul Getty Museum and Getty Education Institution for the Arts. [Chapter 2: The major dimensions of the aesthetic experience. Chapter 4: The form and quality of the aesthetic experience].

Postrel, V. (2003). The substance of style. New York: Harper Collins. [Chapter 1: The aesthetic imperative | Chapter 2: The rise of look and feel | Chapter 3: Surface and substance]

Hofstadter, D. R. (19??). AMBIGRAMMI – the book.

Pirsig, R. (19xx). Zen and the art motorcycle maintenance. Full text available online [link]. Of particular importance to this discussion are chapters 1-9].

November 4
Design & users / Accessibility & Universal Design

November 11
Aesthetics

Main dishes

Csikszentmihalyi, M., & Robinson, R. E. (1990). The art of seeing: An interpretation of the aesthetic encounter. Los Angeles, CA: J. Paul Getty Museum and Getty Education Institution for the Arts. [Chapter 2: The major dimensions of the aesthetic experience]

Postrel, V. (2003). The substance of style. New York: Harper Collins. [Chapter 1: The aesthetic imperative]

Sinclair, N. (2005). Chorus, colour, and contrariness in school mathematics. The THEN Journal.

Norman, D. A. (2002). Emotion and design: Attractive things work better. Interactions Magazine, ix (4), 36-42. http://www.jnd.org/dn.mss/emotion_design.html

Side dishes

Sinclair, N. (2004). The roles of the aesthetic in mathematical inquiry, Mathematical Thinking and Learning, 6(3), 261-284.

Dewey's Aesthetics, Stanford Encyclopedia of Philosophy: http://plato.stanford.edu/entries/dewey-aesthetics
(IMPORTANT: Focus on the following sections:
o 6. Art as Experience
+ 6.1 The Live Creature
+ 6.2 The Live Creature and Ethereal Things
+ 6.3 Having an Experience
Csikszentmihalyi, M., & Robinson, R. E. (1990). The art of seeing: An interpretation of the aesthetic encounter. Los Angeles, CA: J. Paul Getty Museum and Getty Education Institution for the Arts. [Chapter 4: The form and quality of the aesthetic experience].
Postrel, V. (2003). The substance of style. New York: Harper Collins. [Chapter 2: The rise of look and feel | Chapter 3: Surface and substance]
Adams, C. C. (1995). Technological Allusivity: Appreciating and Teaching the Role of Aesthetics in Engineering Design. In D. Budny, R. Herrick, G. Bjedov, & J. B. Perry (Eds.). Proceedings of 1995 ASEE/ IEEE Frontiers in Education 95 Conference. Atlanta, GA.

November 18
Design & Users; Accessibility & Universal Design

Main dishes
Cooper, A. (1999). The inmates are running the asylum: Why high-tech products drive us crazy and how to restore the sanity. Indianapolis, IN: Sams Publishing. [Chapter 7: Homo logicus. P. 93-104; Chapter 8: An obsolete culture. P. 104-120.]
Tognazini, B. (1998) Maximizing windows: Case Study.
Rose, D. H., & Meyer, A. (2002). Teaching Every Student in the Digital Age: Universal Design for Learning. ASCD. [Read Chapter 4: What is universal design for learning & Chapter 8: Making Universal Design for Learning a Reality].

November 25
Design Creativity & Society (Assignment III, due)

Main dishes
Bruce, B. (19??). Innovation and social change – network based classrooms. Chapter 1.
Pool, R. (1997). Beyond Engineering: How society shapes technology. New York: Oxford University Press. [Introduction: Understanding technology. P. 3-15]
Florida, R. (2003). Cities and the Creative Class. City & Community, 2(1), 3-19.
Hospers, G-J. (2006). Book reviews: The rise of the creative class & The flight of the creative class by Richard Florida. Creativity and Innovation Management. 15(3), 323-324.

Side dishes
Hickman, L. A. (1998). Four effects of technology. Philosophy & Technology. 3:4 Summer.
Law, J., & Bijker, W. E. (2000). Postscript: Technology, stability and social theory. In W. E. Bijker & J. Law (Eds.) Shaping technology / building society: Studies in sociotechnical change. Cambridge, MA: MIT Press. P. 290 – 308).
Bijker, W. E. (2000). The social construction of fluorescent lighting, or how an artifact was invented in its diffusion stage. In W. E. Bijker & J. Law (Eds.) Shaping technology / building society: Studies in sociotechnical change. Cambridge, MA: MIT Press. P. 75 – 102).
Brey, P. (1997). Philosophy of technology meets social constructivism. 2(3-4).

December 2
Learning by Design & Design based research

Main dishes
Kafai Y. B. (1995). Minds in play: Computer game design as a context for children's learning. Hillsdale, NJ: Lawrence Erlbaum. [Chapter 1: Learning through design: Review of theory and research issues (p. 1-29)]
Cossentino, J and Shaffer, DW (1999). ''The math studio: harnessing the power of the arts to teach across disciplines.'' Journal of Aesthetic Education 33(1). [offsite link].
Educational Researcher devoted an entire issue (Volume 32 No 1, January/February, 2003) to the "Role of Design in Educational Research" (guest editor Anthony E. Kelly). We will be reading two articles from that special issue.

o Design-Based Research: An Emerging Paradigm for Educational Inquiry (PDF) The Design-Based Research Collective
o Clinical Design Sciences: A View From Sister Design Efforts (PDF). Raul Zaritsky, Anthony E. Kelly, Woodie Flowers, Everett Rogers, and Patrick O'Neill
o Those interested in reading more about this line of work can follow the Master Reference List (PDF) or visit http://www.designbasedresearch.org

December 12
Final presentation of group and individual projects (all assignments due)