Mills College at Northeastern University

ARTG 1001 + 1002, Fall 2023
4:50-6:30 pm, Natural Science, Room 217
Design Perspectives: An Introduction to Design in the World / Seminar
Syllabus
http://www.dubberly.com/courses/perspectives_2023_fall/

Weekly Schedule — Readings due for Thursdays

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	Tues		
		Thrs	
1			
		09.07	Novak+Gowin, *Learning How to Learn*
2	09.12		
		09.14	Koberg+Bagnall, *The Universal Traveler*
3	09.19		
		09.21	Alexander, *Notes on the Synthesis of Form,* pages 73-83.
4	09.26		
		09.28	Dubberly, Evenson, Robinson, "The Analysis-Synthesis Bridge Model"
5	10.03		
		10.05	Simon, *The Sciences of the Artificial,* pages 108-138.
6	10.10		
		10.12	Rittel, "On the Planning Crisis" [wicked problems]
7	10.17		
		10.19	Buchanan, "Wicked Problems in Design Thinking"
8	10.24		
		10.26	Papanek, *Design for the Real World,* pages 14-95.
9	10.31		
		11.02	Costanza-Chock, *Design Justice,* pages 1-68.
10	11.07		
		11.09	Dorst, "Notes on Design: How Creative Practice Works," pages 7-53.
11	11.14		
		11.16	Bonsiepe, *Interface: An Approach to Design,* pages 18-41.
12	11.21		
		11.23	Thanksgiving (vacation)
13	11.28		
		11.30	Rand, "Design and the Play Instinct"
14	12.05		Last class meeting
			-
15	12.12		Portfolio of reading notes (concept map book) due electronically (no exam)
			-
	12.18		Grades due

This syllabus is a living document.
Some aspects will change over the semester.

Weekly Schedule —Assignments Due for Tuesdays

	Tues	Thrs	
1			
		09.07	-
2	09.12		-
		09.14	Readings + notes
3	09.19		Develop a device for sending messages and a code to use with it.
		09.21	Readings + notes
4	09.26		Make a TikTok video describing the design process.
		09.28	Readings + notes
5	10.03		Make 16 2-inch cubes; arrange them in a 4-by-4 grid, with offset levels.
		10.05	Readings + notes
6	10.10		Select four related objects and define their “solution space.”
		10.12	Readings + notes
7	10.17		No class: Experiential Entrepreneurship Trek Day
		10.19	Readings + notes
8	10.24		Make a gift package for six eggs.
		10.26	Readings + notes
9	10.31		Make a package to protect and egg when dropped from 8 feet.
		11.02	Readings + notes
10	11.07		Final project: Musical Instrument for a Child: Diagram a solution space
		11.09	Readings + notes
11	11.14		Week 2: Select an instrument type to build
		11.16	Readings + notes
12	11.21		Week 3: Develop a notation; write a composition; perform
		11.23	Thanksgiving
13	11.28		Week 4: Complete instrument and instructions for use and test
		11.30	Readings + notes
14	12.05		Last class. Week 5: Make a video about your musical instrument project
			-
15	12.12		Portfolio of reading notes (concept map book) due electronically (no exam)
			-
	12.18		Grades due

Weekly Schedule —In-class Exercises (+ Discussing Readings on Thrs)

	Tues	Thrs	
1			
		09.07	Syllabus, Thing to know, College, Goals, Concept maps, What is design
2	09.12		Build a telegraph
		09.14	3 dictionaries x 2 sheets of paper, Reflection
3	09.19		Test devices and codes by sending messages
		09.21	Discuss Shannon model. Marshmallow-spaghetti tower, 2 rounds
4	09.26		TikTok presentations + Crit
		09.28	Draw how-to-make-toast project
5	10.03		16 blocks presentations + Crit
		10.05	Solar system model outside. Juicer experiment, evaluation, solution space
6	10.10		Solution space presentations + Crit
		10.12	Discuss wicked problems
7	10.17		No class: Experiential Entrepreneurship Trek Day
		10.19	Discuss design process, space of design, frameworks
8	10.24		Egg package presentations + Crit
		10.26	Designer Profile Presentations, Group 1
9	10.31		Egg drop: Visit Mill's Musical Instrument Lab
		11.02	Designer Profile Presentations, Group 2
10	11.07		Musical Instrument for a Child: Project Introduction
		11.09	Designer Profile Presentations, Group 3
11	11.14		Work on your instrument (in-class lab visit)
		11.16	Designer Profile Presentations, Group 4
12	11.21		Perform composition
		11.23	Thanksgiving
13	11.28		Instrument + Instructions Due
		11.30	Designer Profile Presentations, Group 5
14	12.05		Last class. Share video about your musical instrument project
		-	
15	12.12		Final project + portfolio of reading notes due electronically (no final exam)
		-	
	12.18		Grades due

Description

This course introduces students to a wide range of perspectives on design as a human activity. It engages students with a rich mix of theories, principles, practices, and histories that constitute our various understandings of design across cultures. It exposes students to the impacts, influences, accomplishments, consequences, possibilities, and limits of design in the world, through lectures, discussions, reflections, recitations, and conceptual exercises. The course is delivered by a weekly combination of lecture and recitation sessions.

Objectives

In this course, students will…

- Explore, know, and connect with the worlds of design, their history, and theory.

- Critically observe, analyze, and document objects, artifacts, sites, and data — in terms of altering form, function, belief, and behavior as well as other dimensions.

- Investigate and understand available paths in design practice.

- Develop abstract thinking and representation to document and reflect on ideas.

- Share thoughts with others and listen to responses. Contribute to generative discourse on theory and practice.

Process

Students will read a series of articles (and book chapters) and then create concept maps or outlines representing the main ideas described in each reading.
The class will discuss the readings and how they relate to one another.
At the end of the course, students will compile a booklet including all their concept maps.

Guests speakers may visit to describe their work.

Students will make three presentations:
- The first is a short video describing the design process.
- The second is on a designer that interests them.
- The third is a video describing their musical instrument project.

Grading

Weekly assignments will be graded plus/check/minus. Assignments receiving a minus should be revised.

The overall course grade will be calculated as follows:
- 25% for in-class participation
- 25% for weekly reading notes (concept maps)
- 25% for weekly projects
- 25% for final project

In-class participation is affected by contributing to discussions;
missed readings and lack of preparation will also be noted.
No incomplete will be given, except in extenuating and unforeseen circumstances,
and you must have already completed a substantial portion of the course,
with a passing grade.

Grade scale from the Academic Catalogue:
A = Outstanding achievement, A– = Less so
B = Good achievement, B+ = More so, B– = Less so
C = Satisfactory achievement, C+ = More so, C– = Less so
D = Poor achievement
F = Failure

Course Policies

Participation is a key part of the class, and participation requires attendance.
Thus, attendance is required, unless a student is sick.
Tardiness and unexcused absences will affect grades.

Reading assignments and class discussions: There will be reading assignments each week, available on the internet or handed-out in class. You are expected to complete all readings and related concept maps before class. You are also expected to actively participate in discussions.

Integrity: You are requested to abide by Northeastern University's Academic Integrity Policy at: http://www.northeastern.edu/osccr/academic-integrity-policy/

###

Weekly Reading Required Note Taking

For *each* weekly reading, create a concept map —
describing the key ideas in the reading.

Start by reading the text; highlight key ideas;
make a list of terms to include;
build a structure linking them.

Some readings feature clear models.
Make sure to include any key models in your diagram.

Don't forget a title, your name, date, assignment, citations.

Format: 11x17 inches.

Save all your weekly notes!
You will need them for the final project — a booklet collecting all your maps.

Suggestions:
- Keep it neat, but don't obsess over the form; the content is what's important.
- Adobe Illustrator is a good tool, but other drawing tools may be used.
- Paint programs, such as Photoshop, are not the right tools.
- Plan to spend 1-2 hours on the readings and 1 - 2 hours on the map or notes.

Due:
Each Thursday, bring a printed version of your concept map to class.

###

Weekly Readings — Locations and Prompts

1 09.07 *Learning How To Learn,* Novak, J., and Gowin, B., Cambridge University Press, 1984. Chapter 2, pages 15-54.
http://www.dubberly.com/courses/design_theory_2017/01._a_Learning_How_To_Learn.pdf

2 09.14 *The Universal Traveler,* Koberg, D., and Bagnall, J., pages 16-100.
http://www.dubberly.com/courses/perspectives_2023_fall/universal-traveler.pdf

3 09.21 *Notes on the Synthesis of Form,* Alexander, C., 1964, Chapter 6, pgs 73-83.
http://www.dubberly.com/courses/design_theory_2017/06._a_Alexander_73-83.pdf

4 09.28 "The Analysis-Synthesis Bridge Model," Dubberly, et al., 2008.
http://www.dubberly.com/wp-content/uploads/2016/02/ddo_interactions_bridgemodel.pdf

5 10.05 *The Sciences of the Artificial,* Simon, Herbert, pgs 108-138.
http://www.dubberly.com/courses/design_theory_2017/07._a_The_Sciences_of_the_Artificial.pdf
The full book is here: https://monoskop.org/images/9/9c/Simon_Herbert_A_The_Sciences_of_the_Artificial_3rd_ed.pdf

Start with the section titled "Finding New Problem Representation."
The ideas he describes on 108-109 are super important.
Also, the definition of design in the second paragraph of page 111 is classic.
Please consider carefully the implications of the rest of that paragraph.

6 10.12 "On the Planning Crisis," Rittel, Horst, (1972): 390–396.
http://www.dubberly.com/courses/design_theory_2017/08._b_Rittel:_On_the_Planning_Crisis.pdf

Consider:
- What is a 'wicked problem'?
- How does a wicked problem differ from other types of problems?
- What are examples of wicked problems?

7 10.19 "Wicked Problems in Design Thinking," Buchanan, R., (entire paper).
https://web.mit.edu/jrankin/www/engin_as_lib_art/Design_thinking.pdf

(Earlier, you read Horst Rittel's introduction to wicked problems.
Buchanan builds on Rittel's ideas and introduces an important model:
the four areas of design, also known as "the four orders of design.")

8	10.26	*Design for the Real World,* Papanek, Victor, pgs 14-95. https://monoskop.org/images/f/f8/Papanek_Victor_ Design_for_the_Real_World.pdf
9	11.02	*Design Justice,* Costanza- Chock, Sasha, pgs 1-68. https://library.oapen.org/viewer/web/viewer.html?file=/bitstream/handle/ 20.500.12657/43542/external_content.pdf
10	11.09	*Notes on Design: How Creative Practice Works,* Dorst, Kees, pgs 7-53. Original copy of the book given to each student.
11	11.16	*Interface: An Approach to Design,* Bonsiepe, G., pgs 18-41. http://www.dubberly.com/courses/systems_2017_fall/05._Bonsiepe.pdf
12	11.23	Thanksgiving
13	11.30	"Design and the Play Instinct," Rand, Paul. https://www.csus.edu/indiv/e/estiokom/design_play_instinct.pdf

Extra Credit: Munari, *Design as Art,* pages 25-51.

Heskett, *Design: A Very Short Introduction,* Chapter 1.

Willis, "Ontological Designing," (entire paper).

Suchman, *Plans and Situated Actions,* pages 1-64.

British Design Counsel, "Double Diamond at 15 Years."

###

Assignment: Message Sending

Find a partner.

Create a device and system to send a message.
Could be a telegraph.
Or flags.
Or lights.

Cannot be shouting.
Cannot be writing the message.

Also create a code.
Represent your code in a code sheet or code table.
Your code should include all the Roman letters (uppercase).
And it will need a space.

Consider if you need any other “special characters”.

Practice sending one-sentence messages,
e.g., “See the dog run.”

In class you will be given a message to send as a test.

Due:
Tuesday, September 19

Purpose:
- Understand what a platform is and how to program it.
- Understand coding and communicating.

###

Assignment: Design Process TikTok Video

Resources:
A compendium of models of the design process.
http://www.dubberly.com/wp-content/uploads/2008/06/ddo_designprocess.pdf

You might also be curious to see this TikTok.
https://www.tiktok.com/@edtechclass/video/7086273503443324203?is_from_webapp=v1&item_id=7086273503443324203

And this one has good lyrics, but the visuals aren't helpful.
https://www.tiktok.com/@boestemac/video/6875857336842358021?is_from_webapp=v1&item_id=6875857336842358021

Extra-credit points if you can find other design process TikToks.

Project:
Make your own TikTok of your favorite version of the design process.
Or create your own version of the process.

Your TikTok should break down the design process into steps and explain the steps.
Ideal length is 30 seconds; should not be longer than 3 minutes (180 seconds).

Requirements:
- Post a version online.
- Share the URL with the class.

Due:
Tuesday, September 26.

Purpose:
- Reinforce the design process.
- Improve communications skills.

###

Assignment: 16 Blocks

Project:
Create 16 cubes, 2 inches in each dimension.

Could be made of wood, cardboard, plastic, metal, etc.
Paper is fine for sketching,
but paper is not rigid enough for a final structure.

Arrange the cubes in a 4-by-4 grid, 8 by 8 inches, with no gaps.

Then connect all the cubes.
However, a full side cannot be connected.
The main rule is that only half the side of a cube can be connected.
Thus no 2 cubes can be on the same level next to each other.
The cubes should be on four different levels, with 4 cubes on each level.

Consider the space of possible arrangements.
Choose a logic for your arrangement; develop a rationale.

Due:
Tuesday, October 3.

Purpose:
- Explore materials; compare their properties
- Develop a system
- Consider craft in making

###

Assignment: Represent a Solution Space

Project:
Select a common object or tool.

Find at least 5 examples.
Take photographs (or find photos).
Enlarge or shrink the images so that they are pretty much the same size.

Arrange the photos in a 2D plane.

Consider a logic for your arrangement.
How are the objects related?
How are they different?
What are the "dimensions" of this "solution space"?

Add a title in the top left.
List the relevant dimensions.
Include your name.
Bring a print to class.

Due:
Tuesday, October 10.

Purpose:
- Understand the concept of solution space
- See artifacts as part of a continuum or manifold of possibilities

###

Assignment: Egg Packaging

Project 1:
Create a gift package that will hold 6 eggs.

It should be easy to carry, keep the eggs safe, and be beautiful.
How will you put the eggs inside?
And how will the recipient open the package?

Consider how you will present the package
and how you will explain it.

Due:
Tuesday, October 24.

Purpose:
- Explore materials; compare their properties
- Develop a 3D form

###

Project 2:
Create a highly functional container to protect 1 egg,
so that it will not crack when dropped from a height of 8 feet onto concrete.

Due:
Tuesday, October 31.

Purpose:
- Explore materials; compare their properties
- Develop a 3D form

###

Assignment: Research, Write, and Present a Profile of a Designer

Project:
Select a designer from the list below or pick another.
Research the designer's life and work — and create a presentation:
- about 5 minutes in length
- at least 12 slides (not more than 24)
- each slide should have a headline (as a sentence, not just one word)
- each image should have a caption
- should include images of the designer and their work
- relevant quotes from them and about them
- images and quotes should list sources (citations)
- keep the graphic design simple, let your subject shine

Key slides are:
- 1. Title slide: Name of designer, type of design, in small type: your name, date
- 2. Timeline: birth, school, where they worked, etc.
- 3. A list of major influences on their work
- 4. What they are known for or why they "matter"
- 5. Their "philosophy" or point-of-view
- 6. Major work 1
- 7. Major work 2
- 8. Major work 3
- 9. Other work
- 10. What they have written
- 11. Critique: Why you like their work (or don't)
- 12. Something surprising you learned about them

Format:
Landscape format slides, 9x16 aspect ratio, in Google slides, Keynote, or PDF.

Due — presentation schedule:
- October 26: Cole, Joseu, Yanxin, Carolyn
- November 2: Katrina, Theo, Bryan, Michelle, Lorenzo, Jazz
- November 9: Gabriella, Cecily, Devynne, Emy, Jake, Josh
- November 16: Selina, Natalie, Hyelynn, Maria, Estelle, Ahana
- November 30: Raine, Yuki, Emily, Nina, Paloma, Maame

Purpose:
- Share a range of practice types
- Learn more about an individual designer

List of Suggested Designers

Product Design	Jony Ive Henry Dreyfuss Raymond Lowey Gui Bonsiepe Shakers Deutsche Werkbund Bauhaus Ulm or Dieter Rams Lisa Krohn Lorraine Justice Victor Papanek Dunne & Raby
Graphic Design	Paula Scheer Paul Rand April Greiman Massimo Vignelli Muriel Cooper Rick Griffith Nontsikelelo Mutiti Meredith Davis Nancy Skolos Lucille Tenazas Kathy McCoy
Interaction Design	Vannevar Bush Ivan Sutherland Douglas Engelbart Susan Kare Elizabeth Churchill Lauralee Alben Jane Fulton Surrey Christina Wodtke
Service Design	Birgit Mager Shelley Evenson Jodi Forlizzi
Design Research	Lucy Suchman Liz Sanders Don Norman

Information Design	Lisa Straussfeld Gerd Arntz (+ Otto Neurath) Karl Gerstner Tomas Maldanado
Social Good	Terry Irwin Cheryl Heller Sasha Costanza-Chock
Game Design	Shigeru Miyamoto Rafael Fajardo Hideo Kojima Eiji Aonuma
Type Design	Carol Twombly Beatrice Warde Zuzana Licko
Business Design	Karin Himba Maria Giudice

###

Assignment: Game or Musical Instrument

The Design Perspectives final project brings together the design issues we have covered in class in a fun way. We will tap into the rich tradition of Music at Northeastern-Mills, instrument making, and the unique resources NEU-Mills has for experimenting with music making.

Project Description:

Final Project [4 weeks] Students will build an instrument, design a notation system for their instrument, compose a piece for their instrument, test their instrument and composition with another student, collect feedback about the instrument provided by the performer, and describe the next steps in improving their designs. An instrument, composition, and a short video are produced and shared as the final project.

11/07, Week 1. Introduction:
Dr. Sudhu Tewari hosts a menagerie of experimental instrument demonstrations.
This will touch upon our previous work: Solution space, Craft, Sending Messages, Organizational systems, Empathy, Firmness, and Delight. It concludes with 3 example projects from which the students can choose. The examples will be fantastic, simple to construct, effective at making sound, and novel.

> Due 11/14: An analysis of the example instruments, describe solution space. Produce [print and bring to class] an 11 x 17 document describing the solution space, and a comparative analysis of the example projects/instruments for peer review.

11/14, Week 2. Build an Instrument, Part 1:
Instrument-building materials distributed to students.
Students experiment with making sounds with their materials and begin making.
Workshop time during class, 2 waves of 14 students each.
The other half of the class presents solution space. [We may use Lisser Hall for this].
Sign up for out-of-class workshop time with Dr. Tewari.

> Due 11/21: Build a working prototype that others can "play". Document fabrication process, produce [print and bring to class] an 11 x 17 sheet for peer review.

11/21 Week 3. Making sound with your instrument:
Come up with a musical notation and compose a 10 to 20 second piece for your instrument using your notation, be prepared to perform your piece. Continue working on your instrument as necessary. Precedents on notation are shared: Glass, Cage, Eno, Bach, ++
Musical notation: https://en.wikipedia.org/wiki/Musical_notation
Workshop time during class, 2 waves of 14 students each.
The other half of the class presents prototype progress. [We may use Lisser Hall for this]
Sign up for workshop time with Sudhu.

Due 11/28: Develop a notation language for your instrument.
Produce [print and bring to class] an 11 x 17 document describing the notation and instructions. Include a separate 11 x 17 sheet which is your composition.

11/28, Week 4. Testing:
Having the instrument and instructions for using the instrument, share your instrument with a partner and help them perform your piece. Collect feedback from your partner on their experience performing. Describe adjustments you would make to your instrument in the future. Make a video of this experience and performance. [Usability testing and feedback.]
Present composition and instrument, demonstrate a performance.
Find partner[s] for testing your instrument and notation.

Due 12/05: A 2-to-5-minute Final Presentation Video [YouTube] that includes.

- Developing your instrument
  Include your analysis of the solution space and how it helped you make decisions about designing an instrument for a child.
  Include photos/videos of fabricating your instrument if available.
- Developing your notation
  Include a segment on how you came up with your notation and composition based on your instrument and your target user, a child.
- Usability testing
  Include a segment on sharing your notation and instrument with a classmate. What worked well? What could be improved for the user?
- Analysis and next steps
  Include a segment describing what would you do differently if asked to design an instrument for a child again based on what you have done in this project.

12/05, Week 5. Final Presentation:
Consists of sharing your video and having your instrument available to play.

###

In-class Exercise 1: Dictionary / Paper Challenge

Materials:
- A ream of standard copier paper (8.5 x 11 inches).
- Three office dictionaries weighing a total of about 10 pounds
- A ruler
- A clock with a second hand
- A white board for recording

Project:
Using just two sheets of paper,
create a structure to support all three dictionaries.

The goal is for the dictionaries to be as high off the surface of a desk as possible.
The structure must be stable enough to stand for at least 30 seconds.

Tape, string, glue, and other materials or fastener are not allowed.

You have 30 minutes.

Suggestions:
Experiment and iterate!
You can only use two sheets of paper at a time.
But you can have as many attempts (and as much paper) as you like.

Reflection:
For the next class, reflect on the dictionary / paper challenge:
- What happened?
- What was the process?
- How might we diagram it?
- What shape might you represent what happened?

Purpose:
- Exercise the design process.
- Reflect on the process in order to build a mental model.
- Make representations of the process.

###

In-class Exercise: Marshmallow Challenge

Materials:
- 1 standard-size marshmallow
- 20 sticks of standard dry spaghetti
- 1 yard of masking tape (can be torn)
- 1 yard of string (can be cut)
- Measuring tape

Project:
In teams,
build the tallest free-standing structure —
supporting the whole marshmallow as far off the table as possible.

The structure must stand on its own.
It cannot be held or lean against anything else.
Not all the materials must be used.
No other materials are allowed.

You have 20 minutes for your first structure.

You will have 10 minutes for your second structure.

Purpose:
- Exercise the design process.
- Work in teams.
- Planning vs prototyping
- Consider hidden assumptions

Resources:
https://www.marshmallowchallenge.com/
https://tinkerlab.com/spaghetti-tower-marshmallow-challenge/

Tom Wujec TED Talk: “Build a tower, build a team.”
https://www.ted.com/talks/tom_wujec_build_a_tower_build_a_team

###

Exercises: To Come

- Organize the scissors solution space

- Dreyfus Measure of Man and Woman discussion

- Maslow's pyramid model discussion

- Make the letters MASK into a face (same as assignment above)

- Pumpkin carving (for fun, since it's Halloween)

- Vitruvius + DVF model discussion

- Solar system video

- Powers of 10 video

###

In-class Exercise: Develop Test Questions

Materials:
- Standard yellow sticky notes (supplied)
- Large poster notes (supplied)
- Sharpies (supplied)
- Your concept maps or outlines from readings and lectures

Project:
In teams of two, discuss the readings and lectures.
Develop a series of questions that could serve for a mid-term.
Reflect on the main ideas from each reading
and the models discussed in each class.
(We are not having a mid-term; this is an exercise instead.)

Time:
20 minutes.

Share out:
Explain your questions and answers with the entire class.

Purpose:
- Review the materials covered so far.

###