

University of California, Berkeley
Jacobs Institute for Design Innovation
MDes Program

Design Frameworks Course (DES INV 200)

Syllabus (version 0.3, September 5, 2025)

at http://www.dubberly.com/courses/frameworks_2025_fall/

Meets Wednesdays, in Jacobs Hall, room 310:

- 3:30 - 4:30 pm, Discussions, small sections
- 4:30 - 4:45 pm, break
- 4:45 - 5:45 pm, Lectures, full group
- 5:45 - 6:00 pm, break
- 6:00 - 7:00 pm, Exercises, individuals or small teams

Faculty:

- Hugh Dubberly, hugh@dubberly.com
- Lingxiu Zhang, lingxiuc@berkeley.edu
- Shelley Evenson, shelleyke@live.com
- TJ McLeish, tjm@tjmcleish.com

Frameworks are “tools for thinking.” Frameworks describe relationships in processes and systems that repeat. We can represent them in diagrams; and we can apply known frameworks to help understand new situations more quickly and work with stakeholders more effectively. They are an evolving set of terms, methods, and models that form the core of professional literacy.

The goal is to become better at “framing” — engaging with a situation, forming mental models of it, and representing those models. The course seeks to expand your vocabulary, so that you think more broadly about what-you-are-doing when you design and more easily share your thoughts.

Design Frameworks is a seminar course (in contrast to a studio course). Each week, you will read two articles, one on the histories of interaction and the other on ways of framing design (design theory). You will make concept maps summarizing each article.

Each class meeting, in the first hour, we will discuss the readings and your concept maps. In the second hour, we will have a lecture related to the readings. Then, in the third session, we will explore a “framework” commonly found in practice; discuss its origins and implications; and apply the model in an in-class exercise.

At the end of the term, students will deliver a book of their concept maps and a final project: a poster-size map proposing their own model of some aspect of design (similar in scope to a term paper). Details follow.

How To Succeed

Design Frameworks is a fun and easy course. All you have to do is:

- Read 2 articles each week
- Make a concept map of each reading
- Show up for each class meeting
- Stay for the whole session and participate actively
- Make 2 short presentations on a reading, (one history, one theory)
- Compile your weekly concept maps into a booklet
- Make a model of an aspect of design in the form of a poster (final project)
- Turn in your work on-time

If you do those things with a reasonable amount of effort, you will have a strong case for earning an “A” grade.

Grading

Weekly concept maps will receive a minus, check, or plus. Assignments receiving a minus should be revised.

Course grades will be calculated as follows:

- 20% for in-class participation (discussions and exercises)
- 30% for weekly concept maps and the final collection
- 20% for 2 presentations on readings (history and theory)
- 30% for the 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 unforeseen circumstances, and you must have already completed a substantial portion of the course, with a passing grade.

Grade scale:

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

You may earn extra credit for:

- finding new models or frameworks and reporting on them
- reporting on examples of models applied in practice
- creating concept maps of additional readings

Course Policies

Frameworks follow the MDes attendance policy:

“You are allowed two unexcused absences during the semester without penalty. Each additional unexcused absence will lower your grade by two-thirds of a letter (for example, an ‘A-’ becomes a ‘B’). Missing more than 20% of course meetings, for any reason (excused or unexcused), is grounds for automatic course failure and will require a mandatory meeting with the teaching staff and program leadership.”

Missing more than 3 class meetings will result in failing Frameworks.
(4/15 = 26%)

Participation is a key part of the course,
and to participate, you must attend — unless you are sick.
If you are sick and will miss a class, please alert us in advance.
Tardiness and ducking out early will affect grades, too.

You should actively participate in discussions; ask questions, be skeptical,
challenge assumptions, offer your experience, suggest analogies.
If the faculty are not clear, please interrupt and ask for another explanation.

Universities rely on the free exchange of ideas.
We expect students to be critical and to debate.
We encourage you to disagree with us and correct our mistakes.

At the same time, we expect students to respect one another.
Not paying attention is the opposite of respecting one another.

You must abide by the University of California’s Academic Integrity Policy.

You may use AI, but you must cite your use of it.
You may even use AI to generate your concept maps;
however, you must be able to show and explain the process you use,
including the prompt sequence.

The articles for weekly readings will be available on the internet.
You should complete all readings and related concept maps before class.

Please note: This syllabus is a living document.
Some details may change over the semester.

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Office Hours

Instructors will be available after class for discussions.
Additional meetings can also be arranged as needed.

Organization Into Teams

In hour 1, reading discussions will take place in 4 sections.
Each section will have ~13 students.
We will post a list of section assignments.

Each section will also have a room (the side rooms off 310).
The section leaders (Hugh, Lingxiu, Shelley, and TJ) will rotate rooms,
so that each group interacts with each leader.

From week two, in each section,
one student will present the history reading,
and another will present the theory reading.
See below for the requirements for those presentations.
Over the semester, each student will make two presentations.
Lingxiu will post a schedule.

In hour 2, we will regroup as a whole class.

In hour 3, each reading section will divide into 3 sub-sections.
Sub-sections will have 4-5 students.
Lingxiu will post a list.
We are being formal about sub-sections to save time in class.
The sub-sections will work together on in-class exercises.

###

Assignment 1: Weekly Reading Concept Maps

For the weekly readings (the one on history and the one on theory), each week, create a concept map describing the key ideas in each reading.

Start by reading the text;
highlight key ideas;
make a list of 12 to 24 terms (the main concepts) to include;
and build a structure linking the terms.
Be sure to label each of the links.

For more on making concept maps, see:
https://www.dubberly.com/wp-content/uploads/2010/03/ddo_creating_concept_maps.pdf

Some readings feature clear models.
Make sure to include any key models in your diagram.
You may also include key passages from the readings (quotations);
be sure to use quote marks and include a citation.

Add a headline summarizing the key idea or point of the reading.
A sentence is more effective than a label.
Place the title in the upper left corner.
Include the article title and author as a subhead.
Also include your name and the date in small type in the lower left corner.
Format: 11x17 inches.

Print your map. Leave enough time before class; avoid the rush.

Save all your weekly maps!

You will need them for a final project — a booklet collecting all your maps.

Suggestions:

- Keep your maps neat, but don't obsess over the form; the content is what's important.
- Adobe Illustrator is a good tool, but you may use other drawing tools.
- Figma is also a good tool.
- Paint programs, such as Photoshop, are *not* the right tools.
- Plan to spend 1-2 hours on each reading and 1-2 hours on each map.

Due:

Each Wednesday, bring a printed version of your concept map to class.
There's a printer you can use in the MDes studio on the second floor.

Purpose:

- Practice analyzing, modeling, and representing.

###

Assignment 2: Reading Presentations

Each week, in each section, one student will present:

- a synopsis of the history or theory reading
- a brief biography of the author (no more than one page)
- 3 questions to kick off group discussions

That means you will make 2 presentations to your group this semester.
(Lingxiu will post a schedule.)

The presentations should be:

- not more than 5 minutes in length
(not more than 1 minute on any slide; some can be a lot less)
- at least 9 slides (not more than 12)
- each slide should have a headline (as a sentence, not just a one word title)
- each image should have a caption
- include images of the author (and their work if they are a designer)
- relevant quotes from them and from others about them
- images and quotes should list sources (citations)
- keep the graphic design simple; let your subject shine

Key slides are:

- 1. Title slide: large: article title + author name; small: your name + date
- 2. Background (e.g., bio) of the author in relation to the work
(Focus on what might have led to this work)
- 3. Relevant influences and author's primary motivation
- 4. Major idea 1 from the reading
- 5. Major idea 2
- 6. Major idea 3
- 7. Critique + praise (What you question)
- 8. Most important part of your concept map of the reading
- 9. Three open-ended, provocative questions for discussion

Format:

Landscape format slides, 9x16 aspect ratio,
in Google Slides, Keynote, PDF, or Figma.
(Lingxiu will create a directory for uploading files.)

Extra credit for making a zoomable information space
that can be navigated serially and "random access".

Purpose:

- Kick-off the group discussion
- Add perspectives on the main reading

###

Assignment 3: Final Concept Map Booklet

Create a booklet summarizing the course.

At a minimum, include the concept maps you made for each reading.

Also include lists of key ideas that you encountered:

- practical frameworks
- ways of framing design (paradigms)
- design definitions
- design principles
- design process models
- emerging technologies

Consider also including notes from discussions, lectures, and exercises.

Format:

- 11" x 17", landscape orientation
- Include a cover with title, your name, date, assignment
- Also include a table of contents (TOC)
- Ensure that the diagrams share a common visual language (style, template)

Suggestions:

1. Complete your weekly assignments —
a diagram illustrating the key concepts from each reading.
2. Make any revisions you need based on written feedback,
in-class discussion, and discussions with your peers.
(Look at their work! Borrow what makes sense—
and cut information that's extra.)
3. User “test” your diagrams with at least one other person.
Get feedback!
Check spelling and grammar.
4. Compile your diagrams in a “presentation book”.

A final version of the book (as a PDF) will be due on December 17.
(Lingxiu will create a directory for posting.)

Purpose:

- Create a reference that you can use later.

###

Assignment 4: Final Project — Poster Diagram

Create your own new model of design-as-a-whole or an aspect-of-design. Any topic from the readings is fair game, e.g., design justice, speculative design, design principles, the space of design, your favorite design process. You may also propose other ideas that interest you.

Make a concept map representing your model at poster-size (22x34 inches). Include a title and signature block.
Print 1 sheet on a plotter or 4 11x17 pages or 8 standard letter pages.

Suggestions:

1. Start with a design theory text; consult other related texts.
Consider how other readings from the course might relate to your model.
(They do not all have to be addressed explicitly.)
2. Name your topic, and write a thesis sentence (i.e., a headline).
Consider how you will present your model to the class.
What's the main idea? What will you say about it? What story will you tell?
Start with a list of terms (concepts) and prioritize and link.
3. Consider this a writing exercise and a sketch, not a typography exercise, but give basic typographic structure to your model, i.e., consider hierarchy. Keep things neat and simple.

First Deliverable Due November 12.

Write a short proposal (less than one page);
include: title, brief description of your approach and model (the story),
and also your inspiration or sources.

Second Deliverable Due December 3.

Create a candidate final version, print it, and bring it to class for critique.

A final version of the poster (as a PDF) will be due December 10.
(Date may change depending on when Jacobs Showcase is.)

Purpose:

- Provide an opportunity to synthesize what you've learned.
- Extend your thinking into new areas.
- Show how your model of design has changed over the semester.

###

Weekly Schedule — Hour 1: Readings due on history of interaction

1	08.27	None - concentrate on <i>Inventing Design</i>
2	09.03	Shannon, “A Mathematical Model of Communications” - Information and communication defined formally
3	09.10	Bush, “As We May Think” - Memex
4	09.17	Sutherland, “Sketch Pad” + video - Direct and parametric modeling, design systems and libraries
5	09.24	Engelbart, “Augmenting Human Intellect,” + The NLS Demo (video) - Augmentation (vs automation); also Ted Nelson’s eulogy (video)
6	10.01	Kay, “A Personal Computer for Children of All Ages” - The Dynabook and the potential of simulation in computing
7	10.08	Licklider, “The Computer as Communications Device” - Computer networks and their uses
8	10.15	Nelson, “A File Structure for the Complex...” + Xanadu and ZigZag (videos) - Hypertext and data structures, also “Dream Machines/Computer Lib”
9	10.22	Cooper, “The Visible Language Workshop” - Origins of MIT’s Media Lab
10	10.29	Suchman, “Plans and Situated Actions” - The contingent character of work, action, and interaction
11	11.05	Pickering, “Cybernetics” - dance of agency
12	11.12	Morozov, “The Planning Machine” - Project Cybersyn
13	11.19	Haraway, “Cyborgs” - Cyborgs
	11.26	Thanksgiving Holiday (no class meeting) -
14	12.03	Final Project Presentations
15	12.10	No class meeting -
	12.18	Concept map book due electronically -
	12.23	Grades Due?

Weekly Schedule — Hour 1: Readings due on design theory

- | | | |
|----|-------|--|
| 1 | 08.27 | Gram, <i>The Invention of Design</i> ,
- overview |
| 2 | 09.03 | Star+Geismar, “Boundary Objects” + Hofstadter, “Analogy” (video)
- Shared mental models |
| 3 | 09.10 | Bonsiepe, “Interaction,” + Verplank (video) + Gibson, “Affordances”
- Models of interaction |
| 4 | 09.17 | Meadows, “Thinking in Systems” + CLD video
- Systems dynamics, feedback |
| 5 | 09.24 | Simon, <i>The Sciences of the Artificial</i> , pgs 108-138
- Satisficing and problem spaces |
| 6 | 10.01 | Schön, “Design as a Reflective Conversation with the Situation”
- Conversation, reflection, framing |
| 7 | 10.08 | Brown, “Design Thinking” + Jen “Design Thinking is Bullshit”
- Design thinking |
| 8 | 10.15 | Johnson+Henderson, “User Conceptual Models”
- Defining an interface in terms of data objects |
| 9 | 10.22 | Winner, “Do Artifacts Have Politics?”
- Social-technical systems |
| 10 | 10.29 | Rittel, “On the Planning Crisis” + Buchanan, “Wicked Problems in Design...”
- Wicked problems |
| 11 | 11.05 | Sterling on Stuart Brand, “Pace Layers”
- Time scales |
| 12 | 11.12 | Costanza-Chock, “Design Justice”
- Matrix of domination |
| 13 | 11.19 | Dunne+Raby, “Speculative Everything”
- Speculative design and the future cone |
| | 11.26 | Thanksgiving Holiday (no class meeting)
- |
| 14 | 12.03 | Final Project Presentations |
| 15 | 12.10 | No class meeting
- |
| | 12.17 | Concept map book due electronically
- |
| | 12.23 | Grades Due? |

Weekly Schedule — Hour 2: Lectures

Please note:

Speakers and topics are tentative and likely to change.

1	08.27	Jorge Arango, on “Context Strategy”
		-
2	09.03	Barry Katz, on Shannon + McLuhan
		-
3	09.10	Hugh: on information architecture (IA) and data structures
		-
4	09.17	TJ, ?
		-
5	09.24	Hugh, on design systems and solution spaces
		-
6	10.01	Barry Katz?, on Design Thinking
		-
7	10.08	Austin Henderson, on user conceptual models + Trillium
		-
8	10.15	Jodi Forlizzi, on Product-Service Ecologies
		-
9	10.22	TJ? Or Barry on Ted Nelson
		-
10	10.29	Shelley, on Service Design (also with Austin on Trillium)
		-
11	11.05	TJ, on “Colloquy of Mobiles”
		-
12	11.12	Review poster proposals
		-
13	11.19	Review poster headlines + outlines
		-
	11.26	Thanksgiving Holiday (no class meeting)
		-
14	12.03	Final Project Presentations
		-
15	12.10	No class meeting
		-
	12.17	Concept map book due electronically
		-
	12.23	Grades Due?

Weekly Schedule — Hour 3: In-class Exercises

- | | | |
|----|--------|---|
| 1 | 08.27 | Draw how-you-make-toast, Cf., Tom Wujec
- Concept maps, process maps, and node-link graphs |
| 2 | 09.03 | Make a code; transmit a message
- Platforms and stacks |
| 3 | 09.10 | Pin-the-tail-on-the-donkey competition + explain how thermostats works
- information flows + feedback |
| 4 | 09.17 | Map the results of reintroducing wolves to Yellowstone
- Stocks, flows, CLDs |
| 5 | 09.24 | Map the space of juicers; also: organize scissors
- Problem spaces, SWOT, t-SNEs, UMAP, PCA |
| 6 | 10.01 | Make a structure from 2 sheets of paper to support 3 dictionaries
- Double-diamond, bridge, SECI, iteration, (vs spaghetti + marshmallows) |
| 7 | 10.08 | Create a proposal for a service in 20 minutes (user, goal, concept, story)
- DVF + Guy Kawasaki pitch template |
| 8 | 10.15 | Explain how to use a clothes-washing machine
- State diagrams and user-conceptual models |
| 9 | 10.22 | Imagine the future of energy
- ? |
| 10 | 10.29 | Propose a health coach for a patient with diabetes
- Digital twins + intelligent agents |
| 11 | 11.05 | Describe the US federal government's structures of change
- Pace layers |
| 12 | 11.12 | Review poster proposals
- |
| 13 | 11.19 | Review poster headlines + outlines
- |
| | 11.26 | Thanksgiving Holiday (no class meeting)
- |
| 14 | 12.03 | Final Project Presentations |
| 15 | 12.10 | No class meeting
- |
| | 12.17 | Concept map book due electronically
- |
| | 12.23? | Grades Due |

Weekly Agenda

Most class meetings will be organized following this format:

- 3:30 Hour 1: Readings Discussion**
Divide into 4 discussion groups of 13, in small rooms.
Pass back previous week's concept maps (5 mins.)
1a: Student presents reading on history (5 mins.)
Discussion (20 mins.)
1b: Student presents reading on theory (5 mins.)
Discussion (20 mins.)
Collect new concept maps (5 mins.)
- 4:30 Break
- 4:45 Hour 2: Lecture/Presentation**
Full-class check-in on logistics and industry news (~10 mins.)
Presentation (~ 30 mins.)
Q&A + discussions (~20 mins.)
- 5:45 Break
- 6:00 Hour 3: Exercise**
Divide into 12 tables of working groups
Explain the project
Do the project
Share with the whole class
- 7:00 Adjourn

Schedule by Week

- 1 08.27 *The Invention of Design: A Twentieth-Century History*, Gram, Maggie, Basic Books, New York, 2025. Pages 1–257. Provided at orientation.
- Make an outline of the book (at least one but not more than three pages).
- What is the thesis of the book?
 - What are the main ideas of each chapter?
 - What did you notice that the author left out (if anything)?
- Bring a printed copy of your outline (one for each team) to class to turn in.
Make sure your name is on it.
(Please also have a version that you can refer to in class.)
- You may work on your outline with up to 5 classmates (for a team of six), i.e., you may each take responsibility for outlining one main chapter or two. You will need to collaborate on outlining the preface, intro, and afterword.
- However, we strongly urge everyone to read the entire book.
(It's well written and an easy read.)
And the book provides an overview of many of the concepts that we will be addressing throughout the semester.
- Reading the book, will also start to build a common frame of reference for you and your colleagues.
- Hour 2: Lecture: Hugh, on frameworks and models
- Hour 3: In-class Exercise: Draw how-you-make-toast
See Tom Wujec's TED Talk
https://www.ted.com/talks/tom_wujec_got_a_wicked_problem_first_tell_me_how_you_make_toast?subtitle=en
- Concept maps, process maps, and node-link graphs
- 2 09.03 “The Mathematical Theory of Communication,” Shannon and Weaver, 1948.
(Feel free to skip all the math.)
https://www.dubberly.com/courses/design_theory_2017/03._a_Shannon.pdf
- For fun: Shannon “Theseus” Robot Mouse in a Maze video
https://www.youtube.com/watch?v=_9_AEVQ_p74
- Also, Charles and Ray Eames, “A Communications Primer” film.
<https://www.youtube.com/watch?v=byyQtGb3dvA>

“Institutional Ecology and ‘Translation’ of Boundary Objects Amateurs and Professionals in Berkeley’s Museum of Vertebrate Zoology, 1907-39,” Star, S. and Griesemer, J., *Social Studies of Science*, 1989, pgs 387-414.
https://www.dubberly.com/courses/design_theory_2017/04._a_Star_Griesemer_1989.pdf

For fun: “Locating Value with Alignment Diagrams,” Kalbach + Kahn.
http://www.piim.newschool.edu/journal/issues/2011/02/pdfs/ParsonsJournalForInformationMapping_Kalbach-James+Kahn-Paul.pdf

Recommended additional reading
Learning How to Learn, Novak, J., and Gowin, B., Cambridge University Press, 1984. Chapter 2, pgs 15-54.
http://www.dubberly.com/courses/design_theory_2017/01._a_Learning_How_To_Learn.pdf

For a summary of how to make a concept map, see...
https://www.dubberly.com/wp-content/uploads/2010/03/ddo_creating_concept_maps.pdf

For some example concept maps used in design, also see...
https://presentations.dubberly.com/concept_maps.pdf

Hour 2: Lecture: Barry on Shannon + McLuhan?

Hour 3: In-class Exercise: Make a structure from 2 sheets of paper to support 3 dictionaries

Double-diamond, bridge, SECI, iteration, (vs spaghetti + marshmallows)

3 09.10 “As We May Think,” Bush, V., *Atlantic Monthly*, July 1945.
<https://web.mit.edu/STS.035/www/PDFs/think.pdf>

For fun, see the original online...
<https://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/>
And see a reprint with images...
[https://worrydream.com/refs/Bush_1945_-_As_We_May_Think_\(Life_Magazine\).pdf](https://worrydream.com/refs/Bush_1945_-_As_We_May_Think_(Life_Magazine).pdf) — reprint with images

Interface: An Approach to Design, “From Material to Digital and Back,” Bonsiepe, G., pgs 26-36
http://www.dubberly.com/courses/systems_2017_fall/05._Bonsiepe.pdf

“Interaction,” Verplank, B.,
<https://vimeo.com/83683447>

Recommended additional reading

Psychology of Human-Computer Interaction, Card, Moran, and Newell
https://courses.dubberly.com/frameworks_2025_fall/Psychology_of_HCI.pdf

Hour 2: Lecture: Hugh: on information architecture (IA) and data structures

Hour 3: In-class Exercise: Pin-the-tail-on-the-donkey competition
and explain how thermostats works
- information flows + feedback

- 4 09.17 “Sketchpad, A Man-Machine Graphical Communication System,”
Ivan Sutherland, MIT, 1963. Read Chapter 1, pages 17-29, also the abstract,
pages 9-10. Chapters 6 and 7 are also worth a look.
<https://www.cl.cam.ac.uk/techreports/UCAM-CL-TR-574.pdf>

Please also watch these Sketch Pad demo videos
<https://www.youtube.com/watch?v=57wj8diYpgY>
https://www.youtube.com/watch?v=6orsmFndx_o

Thinking in Systems, Chapter 1, “The Basics,” Meadows, D., pgs 11-34.
<https://research.fit.edu/media/site-specific/researchfit.edu/coast-climate-adaptation-library/climate-communications/psychology-and-behavior/Meadows-2008.-Thinking-in-Systems.pdf>

Recommended additional reading:

“A Theory of Affordances,” (Chapter 8) Gibson, 1979
https://courses.dubberly.com/design_theory_2017/04._b_Gibson%20Theory%20of%20Affordances.pdf

For fun: Donella Meadows teaching about CLDs at Dartmouth
https://www.youtube.com/watch?v=XL_I0oomRTA

“General Systems Theory: The Skeleton of Science, Boulding, K.
<https://www.panarchy.org/boulding/systems.1956.html>

Hour 2: Lecture: TJ, ?

Hour 3: In-class Exercise: Map reintroducing wolves to Yellowstone
- Stocks, flows, CLDs

- 5 09.24 “Augmenting Human Intellect,” Engelbart, 1962, pgs 4-12 + 30-35 + 42
[https://worrydream.com/refs/Engelbart_1962_-_Augmenting_Human_Intellect_\(typeset\).pdf](https://worrydream.com/refs/Engelbart_1962_-_Augmenting_Human_Intellect_(typeset).pdf)

The NLS Demo, 1968, (video)

Summary (5 min.) <https://www.youtube.com/watch?v=B6rKUf9DWRI>
Full demo, <https://www.youtube.com/watch?v=yJDv-zdhzMY>

Ted Nelson's eulogy for Engelbart, 2013, (video)
<https://www.youtube.com/watch?v=yMjPqr1s-cg>

The Sciences of the Artificial, Simon, H., 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

Recommended additional reading:

“Design and the Play Instinct,” Rand, Paul, 1965.
<https://www.paulrand.design/writing/articles/1965-design-and-the-play-instinct.html>

Hour 2: Lecture: Hugh, on design systems and solution spaces

Hour 3: In-class Exercise: Map the space of juicers;
also: organize scissors
- Problem spaces, SWOT, t-SNEs, UMAP, PCA

6 10.01 “A Personal Computer for Children of All Ages,” Kay, A., 1972.
<https://mprove.de/diplom/gui/Kay72a.pdf>

Supplemental reading:

“Personal Dynamic Media,” Kay, Alan, and Goldberg, Adele, *Computer*, 10(3):31–41. March 1977.
http://www.newmediareader.com/book_samples/nmr-26-kay.pdf

Supplemental videos:

Alan Kay, 1986, “The Dynabook — Past Present and Future,” see 33:00
<https://www.youtube.com/watch?v=GMDphyKrAE8>

Alan Kay, 1996, “Dynabook: The Complete Story,” see 50:00
<https://www.youtube.com/watch?v=IwL3yXdupv0&t=1337s>

Eric Paulos, 2024, “Plastic Dynamism” video
<https://www.youtube.com/watch?v=zhuVPHyb9X0&t=2s>

The Reflective Practitioner, Schön, D., Chapter 3, “Design as a Reflective Conversation with the Situation,” pgs 76-104.
https://www.dubberly.com/courses/design_theory_2017/09._b_Design_as_Reflection.pdf

For fun: “The Design Process,” Schön, D., *Varieties of Thinking*, Ch. 7, pgs 110-140.
https://www.dubberly.com/courses/design_theory_2017/09._a_The_

Design_Process.pdf

Recommended additional reading:

“Understanding Media,” McLuhan, Marshall,
URL TK

Hour 2: Lecture: Barry Katz?, on Design Thinking

Hour 3: In-class Exercise: Make a structure from 2 sheets of paper to support 3 dictionaries

- Double-diamond, bridge, SECI, iteration

7 10.08 “The Computer as a Communications Device,” Licklider, JCR + Taylor, B.
https://worrydream.com/refs/Licklider_1968_-_The_Computer_as_Communication_Device.pdf

“Design Thinking,” Brown, T., HBR
<https://readings.design/PDF/Tim%20Brown,%20Design%20Thinking.pdf>

“Why Design Thinking is Bullshit,” Jen, N., 2018.
<https://www.itsnicethat.com/articles/natasha-jen-pentagram-graphicdesign-230218>

Video: Natasha Jen: “Design Thinking is Bullsh*t”
<https://www.youtube.com/watch?v=V8gjDsW3lsY>

Hour 2: Lecture: Barry, on Licklider + ARPA

Hour 3: In-class Exercise: Create a proposal for a service in 20 minutes (user, goal, concept, story)

- DVF + Guy Kawasaki pitch template

8 10.15 “A File Structure for The Complex, The Changing and The Indeterminate,” T. H. Nelson, ACM 20th National Conference Proceedings, 1965.
<https://csis.pace.edu/~marchese/CS835/Lec3/nelson.pdf>

For fun:

Computer Lib/Dream Machines, Nelson, T., 1974, pdf pages 48-49

https://worrydream.com/refs/Nelson_T_1974_-_Computer_Lib,_Dream_Machines.pdf

Supplemental videos:

Xanadu Space

<https://www.youtube.com/watch?v=1yLNGUeHapA&t=2s>

ZigZag Data Structures

<https://www.youtube.com/watch?v=n22A-Say7do&t=2s>

User Conceptual Models, Johnson, J. and Henderson, A., 2012.

Please read pages 5-36, (Chapters 1-4).

https://courses.dubberly.com/frameworks_2024_fall/Conceptual-Models-Core-to-Good-Design.pdf

For fun:

“Conceptual Models: Begin by Designing What to Design,” Johnson and Henderson, *Interactions*, 2002.

https://courses.dubberly.com/frameworks_2024_fall/Conceptual_ModelsInteractionsPaper.pdf

Supplemental video:

“Conceptual Models: Core to Good Design,” at Stanford, Terry Winograd’s introduction is worth a look

https://www.youtube.com/watch?v=i_DWYYZD31w

Supplemental reading:

Tim Sheiner, “Co-Designing the Digital Machine.”

<https://tsheiner.medium.com/designing-digital-products-with-mental-models-45ac5c0a9dc2>

Hour 2: Lecture: Jodi Forlizzi, on Product-Service Ecologies

Hour 3: Explain how to use a clothes-washing machine

- State diagrams and user-conceptual models

9 10.22

“Computers and Design,” Cooper, M., *Design Quarterly*, 1986.

https://courses.dubberly.com/frameworks_2024_fall/Computing%20+%20Design%20History/Design%20Quarterly%201989/Design_Quarterly_142_Computers_and_Design_Muriel_Cooper.pdf

See also: Print 1962, and DQ 1968.

https://courses.dubberly.com/frameworks_2024_fall/Computing%20+%20Design%20History/

“Do Artifacts Have Politics,” Winner, L., 1980.

<https://www.jstor.org/stable/20024652?seq=3>

For fun: “Do Categories Have Politics,” Suchman, L.

https://www.researchgate.net/publication/213799662_Do_Categories_Have_Politics_The_LanguageAction_Perspective_Reconsidered

Hour 2: Lecture: TJ? Or Barry on Ted Nelson

Hour 3: In-class Exercise: Imagine the future of energy

- ?

- 10 10.29 *Plans and Situated Actions*, Suchman, L., 1985.
https://bitsavers.trailing-edge.com/pdf/xerox/parc/techReports/ISL-6_Plans_and_Situated_Actions.pdf
- “On the Planning Crisis,” Rittel, H., (1972): 390–396.
http://www.dubberly.com/courses/design_theory_2017/08._b_Rittel:_On_the_Planning_Crisis.pdf
- Recommended additional reading:
“Wicked Problems in Design Thinking,” Buchanan, R., 1992.
https://web.mit.edu/jrankin/www/engin_as_lib_art/Design_thinking.pdf
- Hour 2: Lecture: Shelley, on Service Design
(also with Austin Henderson on Trillium)
- Hour 3: In-class Exercise: Propose a health coach for a patient with diabetes
- Digital twins + intelligent agents
- 11 11.05 “Pickering’s Cybernetics,” Pickering, Andrew, 2025.
URL TK
- “Pace Layers,” Sterling, B.,
https://courses.dubberly.com/frameworks_2024_spring/Pace_Layers_Bruce_Sterling.pdf
- For fun: “How Buildings Learn,” Brand, S.
https://courses.dubberly.com/frameworks_2024_spring/How_Buildings_Learn_Stewart_Brand.pdf
- Recommended additional reading:
“The Architectural Relevance of Cybernetics,” Pask, G.
https://www.dubberly.com/courses/design_theory_2017/10._a_Pask_Cybernetics.pdf
- Supplemental video:
Bruce Sterling, “Futures of Cybernetics”
https://www.youtube.com/watch?v=0Y5_oQ9LuzM&t=2s
- Hour 2: Lecture: Hugh, inviting TJ McLeish on “The Colloquy of Mobiles”
- Hour 3: In-class Exercise: Map the results of reintroducing wolves to Yellowstone National Park
- Stocks, flows, CLDs
- 12 11.12 “The Planning Machine,” Morozov, I., *The New Yorker*, October 6, 2014.

<https://www.newyorker.com/magazine/2014/10/13/planning-machine>

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

For fun: *Design for the Real World*, Papanek, Victor, pgs 14-95.

https://monoskop.org/images/f/f8/Papanek_Victor_Design_for_the_Real_World.pdf

Hour 2: Review poster proposals

Hour 3: Review poster proposals

Digital twins

- 13 11.19 “A Cyborg Manifesto: Science, Technology, and Socialist Feminism in the Late Twentieth Century,” Haraway, Donna, 1991
<https://www.sfu.ca/~decaste/OISE/page2/files/HarawayCyborg.pdf>
“Design as Critique,” Dunne, A., and Raby, F., *Speculative Everything*.
https://courses.dubberly.com/frameworks_2024_spring/Speculative_Everything_Chapter_3_Dunne_and_Raby.pdf

Hour 2: Review poster headlines + outlines

Hour 3: Review poster headlines + outlines

Platforms and stacks

- 11.26 Thanksgiving Holiday (no class meeting)

- 14 12.03 Final project presentations

- 15 12.10 No class

- 12.17 Concept map collection (booklet) due electronically
Revised poster diagram due electronically

###

In-class Exercise 1: Draw how you make toast

Black sharpie, copier paper

First iteration:

One person, one page, no words

Group, post-it notes, no talking

Share out and sort by heating method;
then sort by number of nodes

Second iteration:

Group, post-it notes, no talking

Share out and sort by number of nodes

Cf. Tom Wujec: How to Draw Making Toast

https://www.ted.com/talks/tom_wujec_got_a_wicked_problem_first_tell_me_how_you_make_toast?language=en

###

In-class Exercise 2: Make a structure from 2 sheets of paper to support 3 dictionaries
AKA the 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 3: Map the solar system to scale

Each team chooses a planet and calculates its distance at a scale of
One team marks a scale on Le Roy Ave.
Find the right location for your planet.
Leave one person

Cf. Video <https://www.youtube.com/watch?v=zR3Igc3Rhfg>

In-class Exercise 4: Feedback Exercises

1. Pin-the-tail-on-the-donkey competition by reading sections
2. Explain how thermostats work

TK

Cf.

In-class Exercise 5: Washing Machine User Conceptual Model

TK

Cf.

In-class Exercise 6: Represent a Solution Space for Juicers

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.

Purpose:

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

###

In-class Exercise 7: Create a map of technology

TK

Cf. Map from last year

In-class Exercise 8: Create a map of types of design

TK

Cf. Spreadsheet

In-class Exercise 9: Create a proposal for a service in 20 minutes

Start by defining:

- users
- their goals
- a concept + core technology
- story

Consider the DVF model.

Create a presentation describing your proposal.

Use Guy Kawasaki's pitch template.

Cf. DVF collection.

In-class Exercise 10: Wolves return to Yellowstone

Watch the video; map the system with your team; share out.

Cf. BBC documentary etc.

In-class Exercise 11: Propose a digital twin for a patient with diabetes

TK

In-class Exercise 12: Explain your country's national government's structures of change

TK

In-class Exercise 13: Telegraph + 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.

Purpose:

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

###

In-class Exercise 14: Propose your own “Turing Test” to identify humans

TK

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