

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

Design Frameworks Course (DES INV 200)

Syllabus (version 0.4, August 21, 2026)

Refer to http://www.dubberly.com/courses/frameworks_2026_fall/

Timing: Frameworks meets on Wednesdays, in Jacobs Hall, room 310:

- 3:30 - 4:30 pm, **Discussions**, reading 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
- Eric Rodenbeck, erode@stamen.com
- Ben Shaw, ben.shaw@mindspring.com
- Kevin Ma, kevinma1515@berkeley.edu
- John Cain, john@zerowidth.ai

Goals:

The course tries to prepare you for life-long learning: entering new domains.
It introduces you to design discourse: how designers discuss their work.
It seeks to expand your vocabulary, so that you think more broadly
about what-you-are-doing when you design and more fluidly share your thoughts.
It offers a starter-kit (or tasting menu) of frameworks for designing.

Format:

Design Frameworks is a seminar course (in contrast to a studio course).
Each week, you will read two articles and summarize them in a concept map —
one on the histories of interaction and one on ways of framing design (design theory).

In the first hour, we will discuss the week's readings and your concept maps.
In the second hour, we will have a lecture related to the readings.
In the third hour, we will have a small group exercise, exploring a framework.

At the end of the term, students will deliver a “portfolio” of their concept maps
and a final project: a “meta-map” linking the articles and adding a new one.
Details follow.

What are frameworks?

Frameworks exist in every realm of human activity,
for example: art, science, politics, cooking, and even design.
Frameworks form part of the vocabulary of a domain.
(You have already learned hundreds of frameworks;
for example, the haiku format, trig functions, traffic laws,
food wraps, and drop-down menus are all frameworks of sorts.)

A framework is a model of how something *works* —
what it *is* and what it *does*; its structure and its behavior.
Noun and verb; subject and predicate.

Frameworks (and models) are “tools for thinking.”
Frameworks describe *relationships* between *elements* — that repeat.
That is, frameworks describe *systems* and *processes* — that repeat.
Examples repeated in a pattern, structure, or constellation suggest a template;
i.e., theme and variations, type and token, class and instance.

Recognize a pattern, and a framework is likely close-at-hand.
Finding a framework is learning, increasing organizational knowledge.
That’s core to designing.

We can represent frameworks in diagrams, such as concept maps.
Representing a framework makes it visible and less fuzzy;
it opens the framework to reflecting, sharing, and iterating;
and it opens the framework to use and improvement.

We apply familiar frameworks to help us understand new situations;
i.e., here’s what’s important: the new system is like the old in these ways;
e.g., seminars discuss readings; this is a seminar; it will discuss readings.
(In that example, you will also recognize the framework of a syllogism.)

Frameworks help us work more effectively and efficiently,
by building common references with colleagues and stakeholders.

Frameworks abstract: Forefronting some things; backgrounding others.
Frameworks rest on these bedrocks of thinking: contrast and analogy.
Frameworks note differences; distinguish between things.
Frameworks offer analogies between old and new patterns.
(Analogies themselves are a framework, i.e, A:B::C:D.)

Frameworks (and models) are core to professional literacy,
which is continually evolving new terms, methods, and materials.

###

How to Succeed in this Course

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 and engage
- Stay for the whole session and participate actively
- Keep your electronic devices turned off and stowed (not on the desk)
- Make 2 short presentations on a reading, (one history, one theory)
- Compile your weekly concept maps into a portfolio
- Make a meta-map linking the readings (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. Maps 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 (2) 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.

Please be on time; we will start at 3:30 pm.
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.

A word about electronic devices:

You must keep them shut-off, closed, and off-your-desk (stowed away).
(If you need accommodations, please see one of the faculty.)
Working on assignments, chatting, gaming, or surfing is not respectful.
Please don’t create situations in which we have to police behavior.

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 show and explain the process you use, including your prompt log.

The articles for weekly readings are 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 5 sections.
Each section will have ~13 students.

We will post a list of section assignments.
Each section will also have a room
(310, plus the side rooms off 310: A, B, C, + 010C).
The section leaders (Hugh, Lingxiu, Eric R, Ben, Kevin/John) 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 for a lecture in 310.

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.

###

Weekly Agenda (Detailed)

Most class meetings will be organized following this format:

3:30 Hour 1:	Readings Discussion (310, 310A, 310B, 310C, and 010C) Divide into 5 discussion groups of 13, in small rooms. Pass back previous week's concept maps (5 mins.) 1a: Student chalk-talk on history reading (5 mins.) Discussion on history reading (20 mins.) 1b: Student chalk-talk on theory reading (5 mins.) Discussion on theory reading (20 mins.) Collect new concept maps (5 mins.)
4:30	Break (15 mins.)
4:45 Hour 2:	Lecture/Presentation (in 310) Full-class check-in on logistics and industry news (~10 mins.) Presentation (~ 30 mins.) Q&A + discussions (~20 mins.)
5:45	Break (15 mins.)
6:00 Hour 3:	Exercise (in 310) Divide into 15 tables of working groups (4-to-5 students each) Explain the project to the whole class (5 mins.) Answer questions (5 mins.) Do the project (30 mins.) Share with the whole class (15 mins.) Reflect + reminders for next week (5 mins.)
7:00	Adjourn ###

The Loom App — <https://loom.aroughidea.com/>

Loom presents as a software tool for taking notes on readings.
It provides PDFs of all the course readings and affords uploading others.
PDFs offer click-and-drag highlighting.
Highlighted sections ask for descriptions and labels for key concepts.
Concept labels accumulate in lists, which offer linking.
Links also ask for descriptions and labels.
Linked concepts form a knowledge graph, a web of propositions —
noun-verb-noun, subject-predicate-object, a triple — the basis for a concept map.

So: Loom not only augments reading and note-taking,
it also augments concept finding and linking —
key steps in preparing to make a concept map.
Loom graphs can be exported for drawing tools, such as Figma or Illustrator.

Like any tool, Loom has a subversive side: it hopes to change how you read —
and how you think about reading and what it means to make sense.
The hypothesis is that accumulating a list of concepts — a vocabulary —
will compound in value over your time at Berkeley and beyond.
At least, your vocabulary and knowledge graph will provide “context” —
e.g., mark-down files, helping your AI agents produce more relevant results.
Loom does not employ AI; you do the work.

The name Loom is a metaphor for creating knowledge graphs.
You set the Warp (the vertical strands) by finding concepts;
you throw the Weft (the horizontal strands) by drawing links.
The result is a Weave (or Cloth) — a knowledge graph.
For the final project, you will stitch together the many Cloths (many reading)
into a larger Quilt covering the entire semester.

Loom draws on Grounded Theory — coding first open, then axial —
(Glaser + Strauss, *The Discovery of Grounded Theory*, 1967).
Loom grows out of E-Lab’s CAVEAT (Coding And Video Analysis Tool)
for logging key passages of video in design-ethnography projects (1995).
It also builds on Novak + Gowin and their work on Concept Mapping (1984).

Loom was purpose-built for the Design Frameworks course —
an effort led by John Cain, TJ McLeish, and Lingxiu Zhang;
the app itself was crafted largely by TJ. (Thank you, all!)

It is available under an open-source license at <https://github.com/tj60647/loom-demo>
You are invited to fork the code and create new features.

###

Assignment 1: Weekly Reading Concept Maps

Each week, for each readings, create a concept map, describing the key ideas in the reading, (i.e., 2 readings = 2 maps).

All the readings are in Loom and here

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/

Start by reading the text and highlighting important passages; identify key concepts in highlighted passages. Make a list of 12 to 24 concepts (the main ideas in the reading). Link related concepts, and 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 (or diagrams); *include* them in your map.. You may also include key passages from the readings (quotations); be sure to use quote marks and include a citation.

Add a headline sentence summarizing the reading; a noun label is not enough. Take a position; include a verb! Place your headline sentence in the upper left corner of the map. Include a sub-head with the article title, author, and publication date. Directly below, provide a short summary (a couple of sentences). Be sure to include your name and the class date in small type in the lower left corner. Format: 11x17 inches, printed.

Save all your weekly maps! You will need them for a final project.

Suggestions:

- Keep your maps neat, but don't obsess over the form; content is what's important.
- Minimize the number of fonts and colors; do not multiply styles needlessly.
- Adobe Illustrator and Figma are good tools, but you may use other drawing tools.
- 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. Leave enough time before class; avoid the rush. Printers are available on the second floor of Jacobs and in the Wurster studio.

Purpose:

- Practice analyzing, modeling, and representing; learn concept mapping

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Assignment 2: Chalk-Talks on the Readings

Each week, in each section, two students will introduce the readings: one for the history reading and another for the theory reading. That means you will give 2 chalk-talks to your section this semester. (Lingxiu will post a schedule.)

A chalk-talk is an informal presentation with *no digital slides*. Chalk-talks share a mental model by making it seen and heard. Chalk = draw; talk = explain.

Standing at a white board, you will create a simple concept map, drawing and explaining each concept and link — as you go.

In the process, you will *build* a “complete” map, step-by-step:

- Prepare by doing the reading and creating your weekly concept map.
- Boil it down to the top 5-to-9 concepts. (7 is ideal.)
- Figure out the best order for introducing them.
- Start your talk with the most important concept.
- Write it on the board with an erasable marker.
- Explain the concept.
(You might also share a short, related quote from the reading.”
- Write a second concept on the board.
- Explain the second concept.
- Link the two, and explain their connection.
- Continue to add, explain, and link concepts.
- Stop when you have covered the main concepts of the reading.
- Ask the group to respond, and answer their questions.
- End with a thoughtful question to kick off discussions.

The goal is to summarize the reading by drawing a story one idea at a time.

You should *not* draw the map on the board in advance.

You should *not* draw the whole map in silence and then explain it.

However, you *should plan ahead* and practice.

You may bring a note card containing your map to remind you.

The chalk-talks should:

- be about 5 minutes in length
- include roughly 5 to 9 concepts (7 is the sweet spot)

Purpose:

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

###

Assignment 3: Final Concept Map Booklet as PDF

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 16.
(Lingxiu will create a directory for posting.)

Purpose:

- Create a reference that you can use later.

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Assignment 4: Final Project — Chef's Choice Reading + Meta-Map

Preparation:

Choose a new reading (not assigned), and make a concept map.
Your new reading must be related to design history or design theory.

An excellent source is Bret Victor's archive <https://worrydream.com/refs/>
or the ACM Digital Library <https://dl.acm.org/>
or the Moffitt Environmental Design Library, in Wurster.
Send a link to a PDF of your proposed reading to Kevin Ma to confirm.

Create a Meta-Map of the course:

- What did you love, and what did you hate?
- What did you learn?
- What were the big themes?
- What concepts recur across readings?
- How are the readings linked?

- And how is your new reading connected?

- How might you represent all the readings concisely?
- How might you show connections clearly?
- How might you forefront major themes?

Make a map at poster-size (22x34 inches).
Include a title sentence, short introduction (top left), and signature block (bottom).
Print as 1 sheet on a plotter (ideal)
or 4 11x17 pages or 8 standard letter pages taped together neatly (ok).

Consider this a writing exercise, equivalent in effort to a final term paper.
Give basic typographic structure to your map, i.e., consider hierarchy.
Keep things neat and simple.

First Deliverable Due: November 25.

Concept map of your new reading.

Second Deliverable Due: December 2.

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

A final version of the poster (as a PDF) due: December 7.

(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.

###

Weekly Schedule — Hour 1: History of Interaction Readings Due

01	08.26	Koberg + Bagnall, <i>Universal Traveler</i> - Design process models
02	09.02	Shannon, “A Mathematical Model of Communications” - Information and communication defined formally
03	09.09	Bush, V., “As We May Think” - Memex
04	09.16	Sutherland, “Sketch Pad” + video - Direct and parametric modeling, design systems and libraries
05	09.23	Engelbart, “Augmenting Human Intellect,” + The NLS Demo (video) - Augmentation (vs automation); also Ted Nelson’s eulogy (video)
06	09.30	Kay, “A Personal Computer for Children of All Ages” - The Dynabook and the potential of simulation in computing
07	10.07	Licklider, “The Computer as Communications Device” - Computer networks, agents, shared models, and their uses
08	10.14	Nelson, “A File Structure for the Complex...” + Xanadu and ZigZag (videos) - Hypertext and data structures, also “Dream Machines/Computer Lib”
09	10.21	Bush, CG., “Women and the Assessment of Technology” - Unthinking, rethinking, energizing, and transforming
10	10.28	Suchman, “Plans and Situated Actions,” Chapter 1 - The contingent character of work, action, and interaction
11	11.04	Pickering, “Cybernetics” - dance of agency
12	11.11	Cain + Pino, “Navigating Design, Data, & Decision” - Project Cybersyn
13	11.18	Haraway, “Cyborgs” - Cyborgs
	11.25	Thanksgiving Holiday (no class meeting) -
14	12.02	Final Project Presentations + Critiques -
15	12.09	Showcase (exhibit of student work) — no class meeting -
	12.16	No class meeting -
	12.22	Grades Due? - Concept map book due electronically

Weekly Schedule — Hour 1: Design Theory Readings Due

- | | | |
|----|-------|--|
| 01 | 08.26 | Novak + Gowin, <i>Learning How to Learn</i> , Chapter 2, pages 15-54
- Concept mapping |
| 02 | 09.02 | Star + Griesemer, “Boundary Objects”
- Shared mental models; see also: Hofstadter, “Analogy” (video) |
| 03 | 09.09 | Bonsiepe, “Interaction,”
- Models of interaction; see also Verplank (video) + Gibson, “Affordances” |
| 04 | 09.16 | Meadows, <i>Thinking in Systems</i> , Chapter 1
- Systems dynamics, feedback; see also CLD video |
| 05 | 09.23 | Simon, <i>The Sciences of the Artificial</i> , pages 108-138
- Satisficing and problem spaces |
| 06 | 09.30 | Schön, “Design as a Reflective Conversation with the Situation”
- Conversation, reflection, framing |
| 07 | 10.07 | Chaffee, “Three Models of Strategy”
- Linear, adaptive, and interpretive |
| 08 | 10.14 | Johnson+Henderson, <i>User Conceptual Models</i> , Chapter 4
- Defining an interface in terms of data objects |
| 09 | 10.21 | Winner, “Do Artifacts Have Politics?”
- Social-technical systems |
| 10 | 10.28 | Rittel, “On the Planning Crisis”
- Wicked problems; see also: Buchanan, “Wicked Problems in Design...” |
| 11 | 11.04 | Sterling on Stuart Brand, “Pace Layers”
- Time scales |
| 12 | 11.11 | Floridi, “AI as Agency Without Intelligence”
- Decoupling of action from thought |
| 13 | 11.18 | Dunne+Raby, “Speculative Everything”
- Speculative design and the future cone |
| | 11.25 | Thanksgiving Holiday (no class meeting)
- |
| 14 | 12.02 | Final Project Presentations + Critiques
- |
| 15 | 12.09 | Showcase (exhibit of student work) — no class meeting
- |
| | 12.16 | No class meeting
- |
| | 12.22 | Grades Due?
-
Concept map book due electronically |

Weekly Schedule — Hour 2: Lectures

Please note:

Speakers and topics are tentative and may change.

01	08.26	Alistair Vizuet, Hugh Dubberly, Jabari Jenkins,
02	09.02	John Cain, on TBD
03	09.09	Eric Rodenbeck, on TBD
04	09.16	Ben Shaw, on TBD
05	09.23	Lingxiu Zhang, on “AI and Design”
06	09.30	TBD, Jodi Forlizzi ?
07	10.07	TBD, Shelley Evenson ?
08	10.14	Austin Henderson, on User Conceptual Models
09	10.21	TBD, Elena Pacenti ?
10	10.28	TBD, Stef Hutka ?
11	11.04	TJ McLeish + Jake Sheiner on “Colloquy of Mobiles”
12	11.11	Discuss final project
13	11.18	Review proposed readings (i.e., Chef Choice)
	11.25	Thanksgiving Holiday (no class meeting)
		-
14	12.02	Final Project Presentations + Critiques
		-
15	12.09	Showcase (exhibit of student work) — no class meeting
		-
	12.16	No class meeting
		-
	12.22	Grades Due?
		-
		Concept map book due electronically

Weekly Schedule — Hour 3: In-class Exercises

Please note:

Exercises are tentative and may change.

- | | | |
|----|-------|---|
| 01 | 08.26 | Draw how-you-make-toast, Cf., Tom Wujec
- Concept maps, process maps, and node-link graphs |
| 02 | 09.02 | Make a code; transmit a message
- Platforms and stacks |
| 03 | 09.09 | Pin-the-tail-on-the-donkey competition + explain how thermostats works
- information flows + feedback |
| 04 | 09.16 | Map the results of reintroducing wolves to Yellowstone
- Stocks, flows, CLDs |
| 05 | 09.23 | Map the space of juicers; also: organize scissors
- Problem spaces, SWOT, t-SNEs, UMAP, PCA |
| 06 | 09.30 | Make a structure from 2 sheets of paper to support 3 dictionaries
- Double-diamond, bridge, SECI, iteration, (vs spaghetti + marshmallows) |
| 07 | 10.07 | Create a proposal for a service in 20 minutes (user, goal, concept, story)
- DVF + Guy Kawasaki pitch template |
| 08 | 10.14 | Explain how to use a clothes-washing machine
- State diagrams and user-conceptual models |
| 09 | 10.21 | Imagine the future of energy
- ? |
| 10 | 10.28 | Propose a health coach for a patient with diabetes
- Digital twins + intelligent agents |
| 11 | 11.04 | Describe the US federal government's structures of change
- Pace layers |
| 12 | 11.11 | Review proposed readings (i.e., Chef Choice)
- |
| 13 | 11.18 | Discuss <i>The Invention of Design</i> , in discussion sections
- |
| | 11.25 | Thanksgiving Holiday (no class meeting)
- |
| 14 | 12.02 | Final Project Presentations + Critiques
- |
| 15 | 12.09 | Showcase (exhibit of student work) — no class meeting
- |
| | 12.16 | No class meeting
- |
| | 12.22 | Grades Due?
- |
| | | Concept map book due electronically |

Reading Schedule by Week

Throughout *The Invention of Design: A Twentieth-Century History*, Gram, Maggie, Basic Books, New York, 2025. Pages 1–257.

Provided at orientation. (Not available online.)

Due dates:

02	09.02	Chapter 1
04	09.02	Chapter 2
06	09.16	Chapter 3
08	10.14	Chapter 4
10	10.28	Chapter 5
12	11.11	Chapter 6

Make a short outline of each chapter each week.

It should be a bulleted list (less than one page), not a text summary.

- What are the main ideas of each chapter?
- Who are the main characters, and what did they do?

Wrap up by writing a one page summary of the book as a whole:

- What is the thesis of the book?
- What did the author leave out?

13 11.18 Bring a printed copy of your outline to class to turn in.
Make sure your name is on it.
(Please also have a version that you can refer to in class.)

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.

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Universal Traveler, Koberg + Bagnall, William Kaufman, 1972. Pages 1-123

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/01_The_Universal_Traveler.pdf

For fun: more models of the design process

https://www.dubberly.com/wp-content/uploads/2008/06/ddo_designprocess.pdf

Learning How to Learn, Novak, J., and Gowin, B., Cambridge University Press, 1984.

Chapter 2, pages 15-54.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/01_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:

Hugh Dubberly, on reading, frameworks, and models

Jabari Jenkins, case study: designing for a product-service ecology

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

Concept maps, process maps, and node-link graphs

###

02 09.03

“The Mathematical Theory of Communication,” Shannon and Weaver, 1948.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/02_The_Mathematical_Theory_of_Communication.pdf

(Don’t worry about the equations; skip them, or ask an agent to explain them..)

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. Pages 387-414.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/02_Boundary_Objects.pdf

For fun: “Locating Value with Alignment Diagrams,” Kalbach + Kahn.

<http://www.piim.newschool.edu/journal/issues/2011/02/pdfs/ParsonsJournal>

ForInformationMapping_Kalbach-James+Kahn-Paul.pdf

Recommended additional reading

Hour 2: Lecture: John Cain,

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)

###

03 09.10

“As We May Think,” Bush, V., *Atlantic Monthly*, July 1945.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/03_As_We_May_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., 1999. Pages 26-36

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/03_Design_From_Material_to_Digital_and_Back.pdf

For fun, see

“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: Eric Rodenbeck,

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

###

04 09.17

“Sketchpad, A Man-Machine Graphical Communication System,” Ivan Sutherland, MIT, 1963.

Chapter 1, pages 17-29; also the abstract, pages 9-10.

Chapters 6 and 7 are also worth a look.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/04_Sketchpad.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., 1972. Pages 11-34.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/04_Thinking_in_Systems.pdf

For fun: Donella Meadows teaching about CLDs at Dartmouth

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

“General Systems Theory: The Skeleton of Science, Boulding, K.

<https://www.panarchy.org/boulding/systems.1956.html>

Hour 2: Lecture: Ben Shaw,

Hour 3: In-class Exercise: Map reintroducing wolves to Yellowstone

- Stocks, flows, CLDs

###

05 09.24

“Augmenting Human Intellect,” Engelbart, 1962. Pages 4-12 + 30-35 + 42

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/05_Augmenting_Human_Intellect_A_Conceptual_Framework.pdf

For fun:

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., 1969. Pages 108-138.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/05_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

For fun:

“Design and the Play Instinct,” Rand, Paul, 1965.

<https://www.paulrand.design/writing/articles/1965-design-and-the-play-instinct.html>

Hour 2: Lecture: Lingxiu Zhang, on “AI and Design”

Hour 3: In-class Exercise: Map the space of juicers;

also: organize scissors

- Problem spaces, SWOT, t-SNEs, UMAP, PCA

###

06 09.30

“A Personal Computer for Children of All Ages,” Kay, A., 1972.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/06_A_Personal_Computer_for_Children_of_All_Ages.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>

“The Design Process,” Schön, D., *Varieties of Thinking*, Ch. 7, pages 110-140.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/06_The_Design_Process.pdf

For fun:

The Reflective Practitioner, Schön, D., Chapter 3,

“Design as a Reflective Conversation with the Situation,” pages 76-104.

https://www.dubberly.com/courses/design_theory_2017/09._b_Design_as_Reflection.pdf

“Understanding Media,” McLuhan, Marshall,

<https://designopendata.wordpress.com/wp-content/uploads/2014/05/understanding-media-mcluhan.pdf>

Hour 2: Lecture: TBD

Hour 3: In-class Exercise: Make a structure from 2 sheets of paper to support 3 dictionaries
- Double-diamond, bridge, SECI, iteration

####

07 10.07

“The Computer as a Communications Device,” Licklider, JCR + Taylor, B.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/07_The_Computer_as_a_Communications_Device.pdf

“Three Models of Strategy,” Chaffee, Ellen Earle, 1984

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/07_Three_Models_of_Strategy.pdf

Hour 2: Lecture: TBD

Hour 3: In-class Exercise: Create a proposal for a service in 20 minutes

(user, goal, concept, story)

- DVF + Guy Kawasaki pitch template

###

“A File Structure for The Complex, The Changing and The Indeterminate,”

T. H. Nelson, ACM 20th National Conference Proceedings, 1965.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/08

[A File Structure for the Complex the Changing and the Indeterminate.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

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

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/08_User_Conceptual_Models.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

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

https://www.youtube.com/watch?v=i_DWYYZD3lw

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

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

Hour 2: Lecture: Austin Henderson, on User Conceptual Models

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

- State diagrams and user-conceptual models

###

09 10.21

“Women and the Assessment of Technology,” Bush, Corlan Gee, 1983.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/09_Women_and_the_Assessment_of_Tech.pdf

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

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/09_Do_Artifacts_Have_Politics.pdf

For fun:

“Do Categories Have Politics,” Suchman, L.

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

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

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

Hour 2: Lecture: TBD

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

###

Plans and Situated Actions, Suchman, L., 1985.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/10_Plans_&_Situated_Actions.pdf

Please read the one-page Abstract and Preface and chapters 1: Intro,
2: Interactive Artifacts, and 4: Situated Actions
You might skip chapter 3: Plans, if you don't have time.

“On the Planning Crisis,” Rittel, H., (1972): 390–396.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/10_On_the_Planning_Crisis.pdf

For fun:

“Wicked Problems in Design Thinking,” Buchanan, R., 1992.

https://web.mit.edu/jrankin/www/engin_as_lib_art/Design_thinking.pdf

Hour 2: Lecture: TBD?

Hour 3: In-class Exercise: Propose a health coach for a patient with diabetes
- Digital twins + intelligent agents

###

11 11.04

“Pickering’s Cybernetics,” Pickering, Andrew, 2025.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/11_Pickering's_Cybernetics.pdf

For fun:

“The Architectural Relevance of Cybernetics,” Pask, G.

https://www.dubberly.com/courses/design_theory_2017/10._a_Pask_Cybernetics.pdf

“Pace Layers,” Sterling, B., 2014.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/11_Pace_Layers.pdf

For fun:

“How Buildings Learn,” Brand, S.

https://courses.dubberly.com/frameworks_2024_spring/How_Buildings_Learn_Stewart_Brand.pdf

Bruce Sterling, “Futures of Cybernetics”

https://www.youtube.com/watch?v=0Y5_oQ9LuzM&t=2s

Hour 2: Lecture: TJ McLeish and Jake Sheiner on “The Colloquy of Mobiles”

Hour 3: In-class Exercise: Map the results of reintroducing wolves to Yellowstone National Park
- Stocks, flows, CLDs

###

12 11.11

“AI as Agency Without Intelligence,” Floridi, Luciano, 2023.

[https://courses.dubberly.com/frameworks_2026_fall/primary_readings/12_AI as Agency Without Intelligence.pdf](https://courses.dubberly.com/frameworks_2026_fall/primary_readings/12_AI_as_Agency_Without_Intelligence.pdf)

“Navigating Design, Data, and Decision in an Age of Uncertainty,” *Shi-ji*, Cain, John, + Pino, Zach, 2023

[https://courses.dubberly.com/frameworks_2026_fall/primary_readings/12_Navigating Design Data & Decision.pdf](https://courses.dubberly.com/frameworks_2026_fall/primary_readings/12_Navigating_Design_Data_&_Decision.pdf)

No class meeting — Veteran’s Day holiday.

Readings and concept maps are still due.

Concept maps should be posted to Figma.

####

13 11.18

“A Cyborg Manifesto: Science, Technology, and Socialist Feminism in the Late Twentieth Century,”

Haraway, Donna, 1991

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/13_A_Cyborg_Manifesto.pdf

“Design as Critique,” Dunne, A., and Raby, F., *Speculative Everything*.

https://courses.dubberly.com/frameworks_2026_fall/primary_readings/13_Speculative_Everything.pdf

For fun:

Eric Paulos, 2024, “Plastic Dynamism” video

<https://www.youtube.com/watch?v=zhuVPHyb9X0&t=2s>

Hour 2: Review poster headlines + outlines

Hour 3: Review poster headlines + outlines

Platforms and stacks

###

- 11.25 Thanksgiving Holiday (no class meeting)
-
- 14 12.02 Final Project Presentations + Critiques
-
- 15 12.09 Showcase (exhibit of student work) — no class meeting
-
- 12.16 No class meeting
-
- 12.22 Grades Due?
-
- Concept map book 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's TED Talk: "How to Draw Making Toast"

https://www.ted.com/talks/tom_wujec_got_a_wicked_problem_first_tell_me_how_you_make_toast

###

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

####