Critical Making • Spring 2025
Syllabus

Basic Information

Course Number   NWMEDIA 203
Course Title   Critical Making
Units   4
Format   Studio
Spring Semester   Mon / Wed 10 AM – 12 PM
Location   310 Jacobs Hall
22 Jan – 08 May

Instructors

Professor   Eric Paulos
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Office Hours   book online

TA   Hila Mor
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Course Description

Critical Making will operationalize and critique the practice of "making" through both foundational literature and hands-on studio culture. As hybrid practitioners, students will develop fluency in readily collaging and incorporating a variety of physical materials and protocols into their practice. With design research as a lens, students will envision and create future computational experiences that critically explore social and culturally relevant technological themes such as community, privacy, environment, education, economics, energy, food, biology, democracy, activism, healthcare, social justice, etc.

While no previous technical knowledge is required to take this course, class projects will involve basic programing, electronic circuitry, and digital fabrication design. While tutorials and instruction will be provided, students will be expected to develop basic skills in each of these areas in order to complete the course projects. The course will result in a final public show of student work.

Overview of Course

Learning Objectives

The learning objectives of the course are:

1. Develop a critical understanding of emerging making technologies and their role within the current cultural and social context
2. Establish proficiency with the fundamental concepts, methods, and practices of physical modeling, sketching, form giving, electronic prototyping, and hands on making across a range of materials
3. Improve students ability to make expressive, physical, interactive objects that critique and advance computing culture through the production of making and artifact creation
4. Advance the communication and presentation skill of students through the process of the studio critique

While technology is employed as a central creative design material, it is the thoughtful, designerly, crafting, execution, and presentation of various design projects at a range of scales throughout the course that are central to the learning experience. Each project sets up an important question for design, and the completed project provides a response to that question. A compelling project is motivated equally by a specific disciplinary lineage, a socio-cultural design investigation, and a technical exploration. Critical Making mobilizes knowledge, methods, and skills acquired across a student's experience within and outside of this course. This course emphasizes skill building across several domains:and the ability to build proficiency to:

- **Stake a position, and articulate a critical response to a given design brief.** This position must be set within the context of others who have addressed or failed to address the problem.
- Identify the general field of inquiry, and account for the outstanding issues, unexplored areas, or missed opportunities within this field.
- Produce a clear and concise "diagnosis" of a specific problem within this field, state why this problem is significant, and identify others who have addressed this issue in the past.
- **Serve people, and address the needs of stakeholders**. We adopt a broad definition of this term, and see that stakeholders may include individuals, communities, societies, and ecologies.
- Select and develop a design approach that motivates the study, and that is thoughtfully matched with the stated position.
- **Produce an exquisitely crafted technical artifact.** We scope the term "technology" broadly and include physical objects, products, services, environments, curios, interfaces, services, or processes.
- Develop a technical framework through which the study proceeds. The methods of investigation must be matched to the problem at hand, and must be likely to achieve the larger aims.
- Engage meaningfully with an emerging technology, and compellingly present a claim of novelty.

Methods of Instruction

This is a studio class with time devoted to lecture, discussion, practice activities, design worksessions, and critique of student work. This course will consist of two Provocations and a Final Project

demonstrating a functional interactive artifact set within a real life context and scenario. There will also be a series of Field Activities and in class activities that are included in your final grade.

Readings and Media

Readings will be assigned throughout the semester. There will also often be other media to engage with and response similarly such as videos, audio, and/or performances. Everyone is expected to read the readings (and similarly with videos and other media) and complete an online reading response the night before the course readings are to be presented. A set of students will be selected for each reading to prepare a class presentation. All students are expected to engage in class discussions when readings are assigned. This counts towards your class participation grade.

Zip.crit

Most classes will begin with a zip.crit. A zip.crit is a rapid crit of an interface, object, design, etc. We will be rotating through the class roster and choosing one person to do a zip.crit each class. That person will select an interface, object, design, instructable, kickstarter, toy, etc. At the beginning of class that person will briefly introduce the object, interface, design to us. The class will collectively critique the artifact. Zip.crits are broadly defined but are explicitly limited in length of presentation and may not be any artifact or design that the students themselves participated in creating. We are not critiquing your work. In this experience of the course. We are developing your skill at introducing us to a design and leading us through a critique of it.

Worksessions

Worksessions Our special course days were time is allotted during our studio class to work on course projects. During this time the instructors will be providing impromptu desk critiques, and various feedback and support for people to advance their individual projects. It is important that this time is dedicated to the work of the course. Students who did not make good use of worksession studio time will be penalized in their grade.

Critiques

As a studio course, the class is structured primarily around critique. This may include formal juries with invited guests, formal presentations to your instructors and peers, informal discussions in groups, or individual "desk crits." The overall arc of the course is punctuated by a number of critiques. These will sometimes include formal presentations on your part. Similarly, the day-to-day instruction is marked by minor internal critiques and smaller-scale conversations within assigned working groups.

First, some thoughts on what we mean by "critique" in the context of this course.

A design "critique" has historically referred to the process of exercising a critical examination on a proposed work, and making a systematic judgment of it. In design school, this format has long been an important mechanism for evaluating student work, for offering constructive feedback, and for celebrating the hard-won successes of design education.

But the design critique holds more than this instructional utility: it is one of the primary sites in art and architecture for the production of new knowledge and value. The event of a design critique brings together a range of disciplinary stakeholders: students and instructors, designers and specialists, academics and practitioners, and faculty from across departments and colleges. The critique offers an opportunity to invite luminaries from other institutions who often bring very different perspectives

along with them. It is the dynamic center of design culture – a contested and pluralistic space where ideas are continually challenged, where new approaches are tested, and values are advocated for.

In short, the studio critique is a site in which a design discipline is continually made and re-made.

It is remarkable to see your project right there at the center of this process - remarkable, and sometimes jarring. It may be counter-intuitive that, even as your project may be the subject, what is happening in that moment is not always or entirely about your project. A critique offers more than one type of learning opportunity. We are just as likely to depart having gleaned some specific feedback about a design proposal as we are to have learned something about an active fracture within the discipline.

Given the multivalent nature of the design critique, and the multiple learning opportunities offered by the different types of critiques and presentations required by this studio, the evaluation of your performance as a student in the course is based upon: 1) your work, 2) the presentation of your work, 3) attending the presentations of others, and 4) your active participation in the related discussions.

For some the critique will feel natural and positive and refreshing. For others, it will be a new experience and perhaps produce anxiety. Throughout this course, we will encounter the critique across a range of scales. It will become a common vernacular and mechanism for us to learn, question, and advance our knowledge. By leaning in and embracing the critique, this course will develop a fluency and a confidence in this important pedagogical technique that we hope will carry with you throughout your lives and careers.

Evaluation

Work and performance in the course will be evaluated after each Provocation and the Final Project. In addition, the process of exploration is as important as the final product, so it is important that students manage time well and devote time to working on the assignments during the course of a week. If class time is given as a worksession and is not put to good use, students' grades will be penalized. For assignments done in teams, students will be graded on individual contributions as well as synthesis with the team. Work that is late will be decremented in grade.

Grading

Grading is based on:

- Participation in assignments good use of class time: attendance, critiques, (NO multitasking)
- Problem selection and creativity in response to individual design briefs (Field Activity and Provocations)
- Rigorous design explorations
- Quality of craftsmanship and level of completion
- Quality of the team's reflection and communication about a design solution and process

Each assignment will have specific and clearly communicated grading rubric including within the assignment.

For projects done in teams, students will be graded on individual contributions as well as synthesis with the team. Work that is late will be decremented in grade 33% per day.

Overall grading breakdown is as follows:

15%	PARTICIPATION
15%	FIELD ACTIVITIES
10%	PROVOCATION 01
20%	PROVOCATION 02
40%	FINAL PROVOCATION

Rules of Engagement

One of the main learning exercises in this course is the critique. We will be building this skill throughout the semester. Each of the assignments will be critiqued in class. Students are expected to participate fully in class critiques.

Be There

Critique days are mandatory attendance. If you are not in class or late, we will deduct from your attendance grade. There will be no exceptions. Attendance of all classes is mandatory. You are allowed four absences for the semester without penalty (except critique days); thereafter see Attendance Policy for details.. To receive credit for attendance, you must arrive on time. No late assignments will be accepted.

Be Active

During the in class critique everyone is expected to be engaged in the discussion. Assignments, timely attendance, and in-class and team participation are a critical part of the grade. Bringing examples from outside of the class is considered to be an assignment and is also important.

Be Attentive

We will intimately engage with a range of electronics devices throughout the course and you are encouraged to often use such devices. However, at specific times you will be asked to put away various laptops, smartphones, and epidermal electronics. During those times, no laptops, phones, glasses, electronics or other distracting devices are allowed to be used during critique and at other selected parts of class. Failing to put away such devices when asked will result in grade reduction at the instructors full discretion.

Final Critique and Showcase

We Will have a final critique of our work in a classroom setting on 6 May from 1-4PM (note that this is during RRR week). All students are expected to attend this entire, full complete critique session. Failing to attend or participate will result in grade reduction at the instructor's discretion. In addition, there will be a public showcase on the 7th or 8th of May where students will be expected to show their work publicly to a broader invited audience.

Our Studio Life

Studio Code (Agreements)

To create bold work, we have to show up. We have found a code necessary to agree on the basics of a studio culture. While the Studio Values introduced later will guide our work, the Studio Code asks you to commit to how you show up in the studio. Collectively, these become our agreements. They are phrased in the first person because that is the locus of control for each of us. When we each show up, that enables us to show up collectively in a sum bigger than the parts.

- I show up on time
- I come to class unless otherwise agreed
- I bring my most important questions and issues
- I bring my full attention or ask for a shift
- I only work on my Critical Making work during class
- I make more than I consume
- I put away technology unless otherwise agreed
- I speak for myself
- I go wide, forward, further, and weird.

Studio Values

Studio is a collective engagement. Once we show up, how do we show up together to support each other's highest creativity?

After a decade of building explorative technology design programs with roots in engineering, architecture, and design, a collaborative manifesto of our shared values has evolved. This manifesto provides focus, inspiration, and momentum for the playing, learning, and working we do together.

Below are the evolving seven values that help guide how we relate to each other and our work in our Critical Making Studio Course. These seven values help drive our collective work and create collective impact on ourselves, each other, and the world.

1. **Iteratively make and learn:** Designers are makers and learners. Great designers find ways to ask the right questions and evolve iteratively to the right designs.

2. **Share your work:** Our practice is fundamentally collaborative. We find confidence by asking good questions and being open to answers. We openly share our work, seek feedback, and value integrity for our designs and other's. We find our confidence by finding responses.

3. **Push and support:** As designers, we must take risks to make an impact. We are coaches to one another, putting aside competitive impulses and pushing and supporting each other to do our best work.

4. **Ask big questions:** We question the status quo and aim high. Our questions expose to others and to ourselves opportunities that can inspire and challenge us to reach our collective potential.

5. **Embrace optimism**: Technology is a tool that needs full-hearted humans to guide its progress. We seek bravery, hope, and connection. We inspire each other to improve our world by showing up and living studio values.

6. **Work the systems**: Everything is connected. By exploring systems, we design for positive impact while minimizing harmful outcomes. And when the status quo does not support our work, we seek and celebrate creative hacks.

7. **Seek real impact:** We must reality-test with real people. Design always has stakeholders. We ask the world what is most important, show the world our design responses, and learn, measure, and improve.

Acknowledging Peer-to-Peer Engagement and Support

Acknowledging peer engagement and support is essential to nurturing the collaborative spirit that drives our studio. We believe that recognizing those who positively influence, encourage, and critique your work not only strengthens our community but also elevates the quality of our collective efforts.

We are eager to design a policy that allows for the meaningful recognition of peer contributions in class. As a class, we will explore and develop a system for acknowledging those who influence, support, and critique your work in constructive ways. This process will be collaborative, and your input will be crucial in shaping how we recognize and celebrate peer engagement.

For students who go above and beyond expectations in engaging with and supporting their peers, extra participation points may be awarded.

Studio as a Common Information Space

Our studio space is more than a place to work. It is a dynamic environment where learning happens continuously, often in unexpected ways. Seeing the studio as a "common information space" recognises the importance of this space in creating opportunities for informal learning, serendipitous connections, and mutual growth. In such an environment, the boundaries between teaching and learning blur. Every student becomes both a learner and a teacher, contributing to the collective knowledge of the group. By sharing their progress, students not only help themselves but also provide valuable learning opportunities for their peers. This communal approach reinforces the idea that design is a collaborative endeavor, where the success of one student can elevate the entire group.

Policies

Attendance

Please note that during class time, all students are expected to be physically in the studio, making, listening, discussing, and engaging in work specifically to advance their work in the course. We believe that studio is a place of both formal and informal learning and there is much to be gained from merely sharing space with others. Often, unexpectedly there will be brief moments of magic and brilliance in our studio. If you are not there you will miss this critical moment of insight and learning. I have seen it happen many times and I cannot schedule it. Be there!

There are many reasons to list about why you should be in attendance at our studio. Everything from it's the single most important way to advance your learning in the course to showing respect for others. You will not have careers (even if you plan your own individual practices) that let you

disengage from work and ignore others. All of us are excited to be with you and have made time to be here – let's all be here for each other. To avoid issues we will articulate the overall policy below. This policy is designed to be overly generous. No one should fail to attend the number of classes we share below. It is designed to avoid us having to respond to numerous emails and requests and reasons for why you need to miss class. We want to spend time with all of you engaging in advancing your work not having staff meetings to resolve justified and unjustified absences. We also realize you may have exciting opportunities during class where you are united to a job interview at your dream company, attend a research conference to share work, or receive a prestigious design award. You may also be ill. Or have a flat tire on the way into the studio one morning. Our policy captures the flexibility to allow you to hopefully operate successfully with these interruptions. However, as they say, with great freedom comes great responsibility and as such we have very strong consequences for failing to meet the attendance requirements set up below. Our plan is that with the flexibility we have provided everyone will be able to work within the range and we will not hit any of our hard limits.

Below are the exact mechanics of our attendance policy so we don't have any ambiguities:

- Missing class is defined as missing > 5 minutes of class time. Arriving after 10:15 AM or leaving early for example are considered "absent" under this definition.
- Class is defined at Monday's 10:10 AM - noon and Wednesday 10:10 AM - noon
- All students are able to see a view of their attendance record within bCourses and we encourage you to check it regularly.
- We welcome corrections to the bCourses attendance record but all requests must be received within 10 days of the missed class. No attendance records will be revisited after 10 days.
- It is not our policy to work with individual students around excused absences. We feel that this policy adequately covers excused and unexcused absences. For your safety we would appreciate knowing of reasons for your absence such as planned doctor visits, job interviews, etc. These should be sent as soon as they are known, not after they occur.
- All communication about attendance must be sent to the TA, Hila Mor via email at hilamor@berkeley.edu. Emails, slack messages, smoke signals or other communication with any other instructor about attendance will be ignored. Do not ask us in person in class. We need to maintain a single communication thread about each student's attendance. Emails to Hila about various reasons for not attending will not be assumed to be granted and you will be marked absent. If you are ill or sick, obviously, please do not come to class but we may require followup to decide on how to record your attendance. You must communicate such absences within 7 days to be considered somehow exceptional and not absent. In addition all absences will be included in your 6 absent count. If exceptional circumstances arise, for example an injury or illness lasting several weeks, we will obviously work with you to accommodate. However, our plan is to not use this exception unless the full teaching staff views it as necessary. Do not request it for a single or several classes. It is for exceptional cases.
- Students that have missed 5 classes will be told in person or via email that they are at risk of failing Critical Making course and that no future unexcused absences will be allowed.
- You must attend all provocation critique days in full (see earlier in syllabus for those dates) as well as the final critique in full. No excused absences will be allowed for those days.
- Class is not recorded nor is any zoom or tele-presence setup provided on a regular basis in lieu of attendance.

Our policy allows students to miss 4 classes without it affecting your grade. To further clarify, after 4 missed classes your grade will be affected for Critical Making as follow – 4 missed class = grade not affected, 5 missed classes = one full letter grade for class (A → B, B+ → C+, etc), 6 missed classes F (fail) ({A,B,C,D → F}.

After 6 classes are missed you will fail Critical Making and receive an F grade for the course.

We have exactly 27 course meeting days this semester. If you miss 6 that accounts for 22% of the course. You could miss the first full 3 weeks of class in February and not hit this ridiculously high threshold. It is set this high to give you flexibility but there will be absolutely no wiggle room once you hit the 6th absence. You will fail the course immediately. Please understand our rationale and our efforts to be fair with this process. We hope to not have to revisit this policy later in the semester but because the consequences are clear and unambiguous. Thank you in advance for your continued attendance to Critical Making.

AI and ML as a Design Partner

As a designer, you are expected to fluidly engage and leverage a suite of appropriate tools and technologies to support your practice. This suite of tools likely includes (but is not limited to) a paper notebook, a sharpie, a microscope, a precision knife, adhesives, tape, test tubes, an oscilloscope, the Adobe suite, Figma, Miro, Fusion 360, Rhino, and more. One exciting new tool that can come into the designer's practice is the use of AI tools for generating text, images, video, and various modeling and design forms. Like any tool, you are encouraged to be proficient in its range of usage. This included knowing when to use these tools and when to avoid them. They are only that – tools. As such, you must control them and make sure at all times it is your own work, your own vision, your own design that is represented. It is likely that such new technical advances will present challenges to our design process but it is our role to not only integrate them into our practices but bring them in thoughtfully and in the service of our own designs – not to have them lead in creating our work. These tools must always honor the work of the designer and their vision and voice – not be independently generative of the work.

Permissible and Impermissible Collaboration

Group Work

Some projects in this course will call for you to work collaboratively in groups. This might include group assignments, in which a number of students are responsible for together producing some deliverable, as well as informal working groups, in which a number of students participate together in a discussion during class time and are encouraged to work in tandem outside of class. Working effectively in groups is an essential part of professional design practice, the value of which is often understated in educational settings. While group work is evaluated collectively, individual contributions to the group and the overall culture of the class are evaluated individually.

Reviewing lectures and reading materials can be enjoyable and enriching things to do together with one's fellow students. We recommend this. However, individual projects should be completed independently and materials turned in as homework should be the result of one's own independent work. Only certain assignments are meant to be done together in a group.

Professional Mentorship & Consultation

Critical Making students are encouraged to interact with other practitioners, to seek mentorship and advice, and to draw on the wisdom and practice of experts. This may be particularly relevant when students are seeking advice regarding domain specific feedback or insight. Work developed within coursework in the program may be informed by this outside expertise, however projects or prototypes completed for courses should be executed using only the student's own skills and expertise. At all times, students are expected to be doing their own work.

For example, we encourage students to work with Jacobs Design Specialists for advice and guidance related to fabrication and/or production of work. Students may ask Design Specialists for their expert assistance to better resolve a problem or to learn a new fabrication method. However, the actual work must be entirely the student's own. Students who are unclear about expectations should ask their instructor or TA for guidance and clarification.

While there may be situations or circumstances when students pay or compensate participants in their projects, such as volunteers involved in user research, etc., in general, students should not compensate or hire others to complete, fabricate, design, or collaborate on the production of coursework. This includes work that is performed by others even with attribution. That is, if students hire or compensate others for producing their work even if they are credited they will still be held in violation of this policy. The burden is on students to check with faculty leadership if there is any ambiguity with their work within this policy. Work that violates this policy is subject to disciplinary action as outlined within the Berkeley Campus Code of Student Conduct.

Academic Honesty

Everyone in this class is expected to adhere to the Berkeley Honor Code: "As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others."

You are a member of an academic community at one of the world's leading research universities. Universities like Berkeley create knowledge that has a lasting impact in the world of ideas and on the lives of others; such knowledge can come from a student paper as well as the lab of an internationally known professor. One of the most important values of an academic community is the balance between the free flow of ideas and the respect for the intellectual property of others. Researchers don't use one another's research without permission and scholars and students always use proper citations in papers.

Any material in this course that is submitted by you, and that bears your name, is presumed to be your own original work that has not previously been submitted for credit in another course, unless you obtain prior written approval to do so from your instructor. In all of your assignments, you may use words or ideas written by other individuals in publications, web sites, or other sources, but only with proper attribution. If you are not clear about the expectations for completing an assignment, be sure to seek clarification from your instructor or GSI beforehand. Finally, you should keep in mind that as a member of the campus community, you are expected to demonstrate integrity in all of your academic endeavors and will be evaluated on your own merits. The consequences of cheating and academic dishonesty – including a formal discipline file, possible loss of future internship, scholarship, or employment opportunities – are simply not worth it.

You are encouraged to form studio groups and work together to understand studio material, but all work as well as responses to in-class questions should be your own. There are ways to make your work personal and unique even when it seems that there is only one way to correctly answer a question, and the instructors will support you in learning these methods.

Plagiarism/Self-plagiarism

Students must be original in composing the assignments in their classes. To copy text or ideas from another source (including their own previously, or concurrently, submitted coursework) without appropriate reference is plagiarism and will result in a failing grade for their assignment and usually further disciplinary action.

Climate Statement

In this course, we are committed to an equitable and inclusive educational environment for all. As students, staff, and faculty, we strive to foster a community in which we celebrate our diversity and affirm the dignity of each person by respecting the identities, perspectives, and experiences of those with whom we work. We Intend to support a diversity of perspectives and experiences and respect each others' identities and backgrounds (including race/ethnicity, nationality, gender identity, socioeconomic class,sexual orientation, language, religion, ability, etc.). As a member of the UC Berkeley community, we are committed to a safe work environment for all. To help accomplish this: If you feel like your performance in the class is being impacted by lack of inclusion, please contact the instructors, your advisor, or the departmental Faculty Equity Advisor.

Accommodations for Students with Disabilities

As a part of ensuring an equitable and inclusive educational environment, we are committed to ensuring equal access to those students with disabilities. If you need particular accommodations, please contact the Disabled Students' Program (DSP) as soon as possible to request accommodations in your courses and then speak with your instructors. We will take every possible step to work out the necessary arrangements. However, we cannot make accommodations without official communications from DSP so it is important you have such accommodations officially filed and sent to us so we can best support you in a timely and professional manner. Additional information, including on how to request accommodations for your courses, can be found on the DSP website.

Disclaimer

Syllabus and schedule are subject to change. Any necessary amendments to the information provided in this syllabus or in any course documents will be announced and posted in a timely manner in class. All amendments will be in force effective the date they are announced and posted.

Critical Making 2025 • Schedule

wk 1	Mon, Jan 20	No Class
	Wed, Jan 22	Introduction to critical making
wk 2	Mon, Jan 27	Designing Activism
	Wed, Jan 29	Cardboard & Foamcore Hacking
wk 3	Mon, Feb 03	Digital Fabrication
	Wed, Feb 05	Electronics Introduction
wk 4	Mon, Feb 10	Worksession
	Wed, Feb 12	Worksession
wk 5	Mon, Feb 17	Holiday - No Class
	Wed, Feb 19	**Provocation 01 Critique**
wk 6	Mon, Feb 24	Design Noir
	Wed, Feb 26	Communicating Ideas
wk 7	Mon, Mar 03	Bang!
	Wed, Mar 05	Ambiguity, Probes, and Ludic Design
wk 8	Mon, Mar 10	X-Critique
	Wed, Mar 12	Worksession
wk 9	Mon, Mar 17	Worksession
	Wed, Mar 19	**Provocation 02 Critique**
wk 10	Mon, Mar 24	Spring Break - No Class
	Wed, Mar 26	Spring Break - No Class
wk 11	Mon, Mar 31	Wear Me
	Wed, Apr 02	10 Ideas
wk 12	Mon, Apr 07	Speculative Design
	Wed, Apr 09	Worksession
wk 13	Mon, Apr 14	X-Critique
	Wed, Apr 16	Design Futures
wk 14	Mon, Apr 21	Worksession
	Wed, Apr 23	Worksession
wk 15	Wed, Apr 28	Worksession - Open
	Wed, Apr 30	Worksession - Open
RRR	**Tue, May 6**	**Final Critique 1-4 PM**
	Thr, May 8	**Final Public Showcase (time TBD)**