

SYLLABUS

MCEN 4228/5228-003 & ATLS 4519-004

Aesthetics of Design

Spring 2020

MWF 11-11:50, ITLL 1B50

Prof. Jean Hertzberg

Jeanbizhertzberg.com

Aesdes.org

Design is pervasive. The products of design surround us in all aspects of our man-made environment. More importantly, we also design our lives: every choice we make is an element in that process, whether conscious or not. The goals of design can be merely pragmatic; to optimize for best function, for minimizing time and expense, and many engineering designs are done this way. But how impoverished our lives would be if pragmatic considerations were the only criteria! Instead we use aesthetics to guide our choices to make life better for ourselves and others. Aesthetics add meaning and depth to a design, whether we are designing an artwork, a product, a process or our very lives.

Course Goals

- To highlight how aesthetics influence design and vice versa.
- To encourage an expanded perception of design, motivate use of engineering concepts outside the classroom and enjoyment of design as a discipline and art. The vehicle will be a creative aesthetic experience: you will imagine and execute an iterative design-fabrication process, as both a team member and a team leader, with design objectives that range from the traditional aspects of functionality, sustainability, manufacturability, and cost to more elusive objectives like aesthetics, beauty, ethics, meaning, emotion, and the relationship of form to function.
- To provide a venue for student work, as a component of a public design portfolio.
- To practice communication of design, and the articulation of aesthetics and design thinking.
- To instill constructive critique techniques.
- To provide the opportunity to wholly own a design, and see it from conception to finished project.

- To give you a chance to work with students who have different life experiences, and perhaps different disciplines. In this course you will work with a range of colleagues, with a variety of personal and professional interests, and discover your differences and similarities. Hopefully, you'll see value in the range of perspectives.
- To question the relationships between art, aesthetics, science and engineering and how they apply to our lives and professional aspirations.

Learning Objectives (things you will be capable of at the end of the course)

1. Students will execute an iterative design-fabrication process
2. Students will document their design choices, gaining facility in communication and recognition of their own creative processes.
3. Students will demonstrate constructive critique and teamwork skills in the service of their own and other's creative vision.
4. Students will apply select fundamentals of a traditional industrial design curriculum, including art history, hand sketching and fabrication techniques.

Course Format

This course will be a mashup of an engineering projects course, and industrial design course and a studio arts course. Class time will alternate between lectures, student presentations and project work. Topics will include art and aesthetics, and design topics like brainstorming, the documentation process, teamwork, constructive critique, design considerations, and iterative practices. Like other project courses, there will be a critical design review and a final presentation. Differences from other engineering courses will include an emphasis on aesthetics and your freedom in choosing what to create.

You will have access to the resources of the ITLL (ITLL.colorado.edu) and the Idea Forge (in Fleming, <http://www.colorado.edu/ideaforge/>) including workshops (to learn welding etc.), machine shops, electronics shops, workspaces, some storage and access to technician advice. There are no formal lab sessions; instead students are expected to treat assignments as they would for any other course. Team members are expected to make effort to meet with their teams outside of class. **Students are expected to attend all lecture and discussion sessions**, and to bring their laptops or smartphones to offer online critique of each project. **Attendance will be taken for all guest lectures and student presentations.**

Structure

- Individual warm up project: Upcycle. Create an artifact out of inexpensive and/or recycled materials to demonstrate an aesthetic. Deliverables: oral presentation of artifact, blog posts detailing design and fabrication process.
- One main project which you own (and pay for). Requirements:

- Deliverables will be a functional artifact that satisfies an aesthetic of your choice, plus documentation (blogs, including CDR and final reports).
 - The artifact (sculpture) must be dynamic and/or complete a task (demonstrate form/function balance)
 - Art for art's sake is OK!
 - The artifact can be desk toy scale, lobby scale or Burning Man scale, provided work space can be found. Emphasis will be on aesthetics and documentation. For example, a rough finish would need to be justified by an articulated aesthetic.
- **Work trade.** Each student will be expected to contribute 5 hours to help other students in the class, and can thus expect 5 hours of help from others. A Slack list (#worktrade) will let everybody know who and what is available. Whenever you help another student, announce this on the #worktrade channel (so Behruz can track it), and restate your skills and time available. Don't ignore common skills such as steady hands, a car for transport, or access to a free washing machine.

This is an experimental course. We will be studying how to improve the course for the future as well as its effect on you, so you will be asked to participate in surveys and interviews, and have all your work published. If this is going to make you uncomfortable, this might not be the best course for you.

There will be no textbook required for the course, but you will be expected to contribute around \$150 towards any materials needed for your project, in lieu of buying a textbook.

Assignments, Assessment and Grading

While you will get ongoing feedback about your progress, it will not be in the form of points to be accumulated towards a grade. **There will be no concrete grading structure for this course.** Your final grade will be determined by your completion of assignments and your participation in class and team activities. If you need a more concrete grading structure, this course is probably not going to work for you. While detailed grading of your work will not be done, you will receive detailed critiques from other students, and you will be trained to give such critiques. Your work will be checked for completeness and quality, and you will be expected to revise and resubmit your work if requested. It is our hope that you will be motivated to achieve excellence by the actual meaning, context and quality of your work, and its publication on the course website. Note that the expectations for students in the graduate sections are higher, for project quality, blog writing, and leadership in and out of class (i.e. worktrade). In rare cases, substandard work such as poorly executed projects and reports that grievously fail spell and grammar checks will result in lowered course grades.

Here is a list of activities that contributed to course grades last year. This is given only as an example of the type of activities we will undertake; **this semester will be a bit different from this list:**

Signed syllabus (paper copy)

An updated version of this information may be available at AesDes.org. Version 1/10/2020

Signed use/copyright agreement (paper copy)

Blog content—at least one blog post per week, including the following topics:

Aesthetic Exploration

Initial progress on upcycle project

Upcycle inspiration

Upcycle final report

Skill sets and personal aspirations

Main project inspirations

Top 5 constraints for your project, including aesthetics

Design review summary (and next steps)

Your aesthetic: relationship to 20th century movements. Alternate aesthetics.

Main project construction timeline

Construction update

Final project Part 1: What and How

Final project Part 2: Why and What Next

Summing Up

*Please feel free to post on other subjects or to split these topics up into multiple posts.

Detailed critiques of classmates' blogs

Design review presentation

Design review critique (given to everyone in your pod)

Final design review presentation

Final design review critique (given to everyone in your pod)

Presentation at our class Expo, and optionally the ATLAS and CEAS Expos

Course feedback survey x2 (you'll get the 2nd one after the final projects are due)

Final project (the actual object you've designed is the deliverable; but it is yours to take home)

Attendance, regular classes, presentations and guest lectures

Prerequisites and Degree Credits

There are no formal prerequisites, but it is understood that by signing up for this course, you feel you have something to offer a design team—either artistically, computationally, philosophically or hands-on skills. This course counts as an upper division technical elective towards engineering degrees in the College of Engineering and Applied Science (specifically as an enrichment course for the MS in ME Design Track), as a TAM "Focused Elective" course, and may be petitioned as studio or production credit towards fine arts degrees in the College of Arts and Sciences or as an upper division science credit towards any A&S degree. If your project incorporates a musical element, it can count towards the Music Technology Certificate, in the College of Music.

Contact Information

Instructor: Prof. Jean Hertzberg

Email: Hertzberg@colorado.edu

Office: ECME 220, 303-492-5092

Personal Webpage: <http://jeanbzhertzberg.com>

Teaching Assistant: Behruzkhon Rashidov (Behruzkhon.Rashidov@Colorado.EDU)

Behruz is happy offer assistance with Solidworks.

Course Website

<http://aesdes.org> is a Wordpress blog site that will be co-created by students and instructors. You will receive a login as a contributor. You will be expected to make regular posts throughout the semester, documenting your design process and reflecting on it. Sometimes topics will be specified, but you are not restricted to required topics. You will also be expected to comment on other students' work, live, in class during presentations and asynchronously as well. This blog will be the publication venue for your work, and will contain updated course information as well. The TA will monitor the blog and update your 'grades' in Canvas accordingly. This website is reasonably high-visibility, receiving an average of 140 views per day from around the world. When you or an employer google your name in future years, your work published on this site will be near the top of the list (try googling a student from a couple of years ago and see).

Textbooks

No textbooks are required for this course. Instead, students are expected to research background information online and in the archival literature (yes, you might have to go to the library!). Specific readings will be provided via a Zotero group library. Go to Zotero.org and make a login for yourself. You will get an invitation email from me, and you can go to www.zotero.org/groups/aedes and request membership.

The following texts are recommended. All are available online from Amazon.com or other booksellers. Additional texts are listed in the Zotero library. I own most of these, and you can preview them in my office or check them out. Many are available in the Engineering and/or MathPhysics Libraries on campus. **Several cost less than a pizza, and will serve you well both this semester and in years to come:**

[Universal Principles of Design, Revised and Updated: 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions.](#) Lidwell, William, Kritina Holden, and Jill Butler. Rockport Publishers, 2010. ISBN 978-1-61058-065-6. Kindle edition:\$14. A PDF

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is available in our Zotero library. The book is alphabetically arranged two-page articles on a range of design topics. A number of videos based on the book are available at LinkedIn Learning.com (formerly Lynda.com), available through myCUinfo; we will view some in class. Sign in to Lynda.colorado.edu with your Identikey, then search for the title.

[Sketching: The Basics](#). Amsterdam: BIS Publishers, 2011. Steur, Roselien, and Koos Eissen. ISBN 978-90-6369-253-7. \$20 to \$40. This is the text we'll draw our sketching curriculum from.

[Critical Response Process: A Method for Getting Useful Feedback on Anything You Make, from Dance to Dessert](#). Lerman, Liz. EBook.\$9.50, 2002. This short book describes the critique process we'll be using this semester. It's a helpful process that can be applied in any feedback situation.

[Emotional Design: Why We Love \(or Hate\) Everyday Things](#). Norman, Don. New York: Basic Books, 2003. 978-0-465-05135-9. Available used from \$3.50. Attractive things really do work better, and this book discusses the research behind this and how to use this fact in improving designs.

Design in the USA. Jeffrey L. Meikle. Oxford Press. 2005. ISBN 978-0192842190. \$27.74. A brief but thoughtful look at the aesthetics of design in America, from the 1790s to the 1990s. Lots of pictures and examples.

The Aesthetics of Design. Jane Forsey. Oxford Press. 2013. ISBN 978-0199964369. \$44.96. A thorough analysis of current and historical philosophy and psychology of aesthetic design. An academic read, but it reveals with great clarity the most current trends in aesthetic analysis.

Phaidon Design Classics Volumes 1,2 and 3. London ; New York: Phaidon Press, 2006. ISBN 978-0-7148-4399-5
Available as an app for iPad, \$15 (hardcopy is \$160) <http://www.phaidon.com/apps/phaidon-design-classics/>.

"The three-volume book is an authoritative collection of design classics, which includes 999 industrially manufactured products, carefully selected by a group of experts. From cars to furniture, from tableware to cameras, from everyday objects to aeroplanes, this breadth of classic design has never before been collated. These volumes will be the sourcebooks on design from the early 1800's to the present, bringing together patents, prototypes, old advertisements, original drawings, images showing the process of manufacture, as well as rare archival photographs. Over fifty authors ranging from designers to curators, critics, and academics, have contributed with short texts for each objects, providing detailed research and precise information. Each artifact gets 2 pages"

[Design of the 20th Century](#). Fiell, Charlotte & Peter.. Taschen America, 2012. \$20
A-Z plus timeline. 2 page spread per artifact. We will discuss timeline in lecture after universal aesthetics.

[1000 Chairs](#). TASCHEN Books (Bibliotheca Universalis).

Chairs are the typical object whenever design is discussed. Here are 1000 famous chairs of the 20th Century. \$16.00

[Industrial Arts Design :a Textbook of Practical Methods for Students, Teachers, and Craftsmen](#)

Varnum, William Harrison. Peoria, Ill. c1916. A free eBook on details, recipe and tutorial of Arts and Crafts style design.

Publications and Public Presentations

This course has the potential to attract a great deal of attention. Student projects from this course may be published in professional journals and on the web, with the instructors as co-authors. **Thus, students will be asked to submit high resolution digital files of any photos or videos and release a non-exclusive copyright to the instructors.** All web content is published under a Creative Commons Attribution-NonCommercial license. Students who supply contact information will be kept informed of all future publications of their work. Any images and reports produced for the course will be published on the course website.

You will be expected to display your work at Final Exam Showing (snacks provided, invite family and friends), and optionally in the CEAS and/or ATLAS spring design expos. Your final presentations will be in class, last week of the semester.

Professionalism Expectations

A primary objective of the Mechanical Engineering Department is to prepare each of our students for careers in the engineering profession. As professionals, engineers must meet high standards of technical competence and ethical behavior. According to the Accreditation Board of Engineering and Technology (ABET) code of ethics, engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

1. Using their knowledge and skill for the enhancement of human welfare;
2. Being honest and impartial, and serving with fidelity the public, their employers and clients;
3. Striving to increase the competence and prestige of the engineering profession.

The Department of Mechanical Engineering (ME) believes that it is essential for each of you to learn the professional behavior that will prepare you for your career after college. Therefore, in each mechanical engineering course you will be required to practice the professional behavior that will be expected by your future employers. This syllabus clearly outlines the ME policy regarding academic integrity and academic climate. These policies will be upheld in each of

your courses throughout the mechanical engineering curriculum. However, we also expect that this culture of professionalism will pervade all of your University of Colorado experiences.

Academic Integrity

You will be asked to complete individual homework assignments in this course. Though you may work in groups to discuss and solve problems, it is expected that you will abide by the University of Colorado at Boulder honor code at all times. Therefore, you may not plagiarize images or reports or allow another student to plagiarize your work. Examples of plagiarism include: copying from a solution manual, copying from Internet sites, copying from previous academic year homework sets, and copying directly from classmates. However, in your reports **for this course** you can (and should!) use direct quotes and paraphrased information from the Internet and other published sources **as long as you properly cite the source**. If you have any doubt about how to cite, or whether you are using sanctioned materials, please ask. Citation techniques will be covered in lecture. Plagiarism detection will be used randomly.

Any instances of dishonesty on homework or tests will result in a minimum sanction for your first violation of the honor code of a zero score and an entry in your department file. Additional sanctions will be imposed by the ME Department for subsequent violations, possibly including expulsion from the ME program. You may contest any accusation according to the campus honor code system.

University of Colorado at Boulder Honor Code Policy:

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at <http://www.colorado.edu/policies/honor.html> and at <http://www.colorado.edu/academics/honorcode/>

Mechanical Engineering Graduate Program Integrity Policy:

All students in the Mechanical Engineering Graduate Program are expected to uphold the Honor Code. The purpose of CU's Honor Code is to secure an environment in which academic integrity is valued and students and faculty act accordingly. The following principles are to be upheld: honesty, trust, fairness, respect, and responsibility. Below are excerpts from the policy. More information on the policy can be found at <http://www.colorado.edu/mechanical/programs/graduate/current/index.html>.

If a faculty member suspects a student of cheating, the faculty member is expected to document the event(s) in writing. Documentation should be submitted to the Graduate Committee within two weeks of the event. The Graduate Committee will review the event(s) and documentation and recommend an academic sanction to the faculty member. This review can include an interview with the faculty member and/or the student. The recommended academic sanction should be implemented within four weeks of the event. Minimum sanctions could include a zero score for homework or a zero score for an exam. If the faculty member invokes an academic sanction, the faculty member shall communicate the decision to the student in writing and include a brief summary of the faculty member's reasoning.

Any academic or non-academic sanction that has been applied to a student in the ME department must be documented in their department file. This includes sanctions and cases of cheating found in other programs and departments at the University of Colorado. The student's advisor will also be notified when such an event has occurred and has been documented in their file.

Academic Climate

In Class Expectations:

It is our expectation that each of you will be respectful to your fellow classmates and instructors at all times. In an effort to create a professional atmosphere within the classroom, it is requested that you:

- Arrive to class on time
- Turn off your cell phone
- Limit use of your laptop computer to class purposes
- Put away newspapers and magazines
- Refrain from having disruptive conversations during class
- Remain for the whole class, or if you must leave early do so without disrupting others
- Display professional courtesy and respect in all interactions related to this class

Compliance with these expectations will assist us with the creation of a learning community and a high quality educational experience. The University of Colorado Classroom behavior policy will complement the outlined classroom expectations. The University of Colorado Classroom Behavior policy is stated below.

University of Colorado Classroom Behavior Policy:

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual

orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at <http://www.colorado.edu/policies/classbehavior.html> and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

Discrimination and Harassment:

Discriminatory and harassing behavior will not be tolerated in the Department of Mechanical Engineering. A safe and inclusive environment will be created and maintained by the students and instructing faculty member. Students with concerns about discrimination or harassment actions should immediately contact the instructor, the Department Chair or their academic advisor, or contact the Office of Discrimination and Harassment (below).

Examples that may be considered harassment:

A teaching assistant or instructor asking a student for a date.

Displaying sexually explicit material in an academic setting (including laptop wallpaper).

Persisting in asking a classmate for a date after being turned down.

Using degrading terminology in referring to others, including peers.

The University of Colorado at Boulder policy on Discrimination and Harassment, the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships apply to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH, the above referenced policies and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at <http://www.colorado.edu/odh>

Out of Class Expectations:

Though many of the above stated policies address academic climate within the classroom, these policies should also be upheld outside of the classroom. As a member of the ME community you are expected to consistently demonstrate integrity and honor through your everyday actions. Furthermore, faculty and staff members are very willing to assist with your academic and personal needs. However, multiple professional obligations make it necessary for us to schedule our availability. Suggestions specific to interactions with faculty and staff include:

- Respect posted office hours. Plan your weekly schedule to align with scheduled office hours
- Avoid disrupting ongoing meetings within faculty and staff offices. Please wait until the meeting concludes before seeking assistance. Respect faculty and staff policies regarding use of email and note that staff and faculty are not expected to respond to email outside of business hours. Send emails to faculty and staff using a professional format. Tips for a professional email include:

- Always fill in the subject line with a topic that indicates the reason for your email to your reader.
- Respectfully address the individual to whom you are sending the email (e.g., Dear Professor Smith).
- Avoid email, chat room or text message abbreviations.
- Be brief and polite.
- Add a signature block with appropriate contact information.
- Reply to emails with the previously sent message. This will allow your reader to quickly recall the questions and previous conversation.

Accommodation of Disabilities or Religious Commitments

If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, and <http://www.Colorado.EDU/disabilityservices>

If you have a temporary medical condition or injury, see guidelines at <http://www.colorado.edu/disabilityservices/go.cgi?select=temporary.html>

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. *In this class, attendance is required for critique sessions and guest lectures, so please check the posted schedule, and let me know of any conflicts within the first two weeks of the semester.*

_____ SIGNATURE PAGE _____

I, the undersigned, agree that I have read and understood the policies described in the syllabus for MCEN 4228/5228 & ATLS 4519-004, Aesthetics of Design. I hereby agree to comply with these policies.

PRINT NAME _____

SIGNATURE _____

DATE _____