ID 341 FMH305, Faculty Memorial Hall | Room 305 NJIT Spring 2025 Mondays & Wednesdays 10:00 AM - 11:20 AM

"There are professions more harmful than industrial design, but only a few."

- from the book "Design for the Real World: Human Ecology and Social Change" by Victor Papanek, designer and educator

Course Description

This seminar course takes a critical look at our human ecology, the environmental impact of industrial production and the responsibility of the designer within this system. Ecology and production are explored through material categories, elucidating the material's history, properties and applications, fabrication methods, environmental impacts, and alternative strategies. We will expand the definition of the "designer" from creative problem solver and stylist to activist, altruist and critical industry and environmental partner. We will also push the goals of "sustainability" from being "less bad" to being "good".

The course is conducted from a product design point of view looking at materials such as metals, polymers, elastomers, glass, ceramics, paper, composites, and other engineered materials as well as processes such as forming, casting, cutting, joining, and finishing. Materials and processes will be looked at from a new perspective and renewed sense of appreciation. The course encompasses a range of approaches that will enhance the value and intelligence of your designs as well as hone your research, critical thinking and presentation skills through lectures and discussion, in-class activities, research projects, videos and, hopefully, fieldtrips.

Course Objectives

- Develop awareness and understanding of ecology and global trends
- Develop awareness and understanding of connections between industrial production & the environment
- Appreciate and apply the life cycle approach
- Develop awareness and understanding of strategies for mitigating environmental degradation
- Appreciate that material selection is only a component of the ecological design process
- · Hone research, critical thinking and presentation skills
- · Identify the parts, materials, and production methods of a product
- Identify and propose strategies for reducing and/or eliminating negative environmental impacts with the ultimate goal of producing a positive environmental impact
- Generate a Life Cycle Assessment using SolidWorks software
- · Produce content that demonstrate these acquired skills

Your Responsibility

- **Participate in class** discussions. Contribute individual experiences and opinions when relevant to the topic so that others can benefit and learn. This is a big part of the class.
- Ask questions...there is no dumb/bad question.
- **Respect** others opinions, and their social, cultural, political, moral and religious point of view.
- **Cell phones should be turned off** at the beginning of class unless you are emergency personnel on-call. Activation or use of a cell phone will be penalized.
- Take individual responsibility for completing and submitting assignments on time.
- **Participate in all team-related** activities, homework assignments, presentations and exercises.
- Check e-mail and Canvas frequently. Everyone must have an active e-mail address. You can receive a free e-mail address and access to the Internet from NJIT.
- At the end of semester all work produced for this class **shall also be uploaded to Kepler.** Failure to do so shall result in a failing grade until this requirement has been satisfied.
- **Regular attendance** is expected. When possible, please give advance notice of your absence. NJIT requires attendance for **ALL** students. After 3 recorded absences, your grade will be lowered by one-half (½) grade point for each additional absence, if you are not carrying a medical, school or religious related excuse. No excuses will be accepted without a written note from the Dean or a doctor. Students with particular needs and foreseen absences should present them to their instructor within the first week of class.

<u>Attendance for student athletes</u>: No student athlete may miss any regularly scheduled classes for any practice activities. This means students can neither miss nor leave class early (or arrive late) to attend a practice. While student athletes may miss class when participating in intercollegiate competition, it is the responsibility of the student athlete to proactively inform the instructor well in advance to make appropriate arrangements to complete or make up any assignments or exams in a timely fashion.

• Lateness is inconsiderate and disruptive - and will not be tolerated. Four lates will be counted a one absence.

• Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:

http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

Artificial Intelligence

Generative artificial intelligence has the potential to improve decision-making and enhance creativity and productivity.

While it does not have to be used in every (or any) project, it is certainly a tool that could be used to benefit under appropriate circumstances. There may be times when an instructor prohibits the use of generative AI, and times when its use is required. Follow the instructions of your teacher. However, to uphold academic integrity with the use of AI. students must consider the limitations of AI and use it critically and ethically. Be aware of the possibility of bias, incomplete and/or inaccurate information, plagiarism, and issues of data privacy. Generative AI tools can produce invalid and inaccurate information (also known as "hallucinations"). Students are responsible for any and all information or work presented that is generated in any capacity with AI tools. For graphic endeavors, students must cite the use of AI and document intermediate design steps showing text and prompts along with any images generated by AI. Tool(s) used must be cited. Do not simply copy and paste Al-generated material and claim it as your own (text or graphics). Even re-writing Algenerated output into your own words requires proper attribution. Modifications made by the designer and the way Al-generated work is used must be made clear and documented. In other words, the design and presentation processes must be documented when AI-generated work is incorporated at any step. Finally, for your own protection and to respect the privacy rights of others, do not use your personal data (including NJIT UCID), or that of others, in any prompts for AI generated material. Ever. The use of AI generative tools in design schools is in the experimental stage.

The guidelines above are based, in part, on developmental work and standards generated by the University of New South Wales in Sydney, Australia and Lawrence Technological University in Detroit, Michigan.

Accommodations for Disabilities

NJIT and instructors will endeavor to make any accommodation required and necessary for the success of students with disabilities. However, in order to receive accommodation(s), disabilities MUST be documented with NJIT Office of Accessibility Resources and Services (201 Kupfrian Hall; oars@njit.edu) and notification of request for accommodation must be made to the instructor by the second week of class. More information may be found at:

https://www.njit.edu/accessibility/. No accommodations can be granted "after the fact" unless due to a situation (injury/illness/etc.) that occurs or is documented during

the semester. In those instances, accommodations will commence upon notification or observation of the disability. If approved for accommodation(s), it is at the discretion of the approved students whether to avail themselves of these opportunities.

Failure to utilize approved accommodations will not be considered when preparing final grades or assessments for the course. Please understand that some accommodations are publicly evident (like extended time on project presentations) and utilization of these accommodations will be seen by other students which removes any right(s) to privacy about those accommodations.

Lectures may NOT be recorded. Due to the inclusion of copyrighted material/intellectual property within "fair use" provisions, visual content of the lectures may NOT, under any circumstances, be recorded, photographed, or distributed. Any asynchronous supplemental lectures will generally be available for one week, starting at the class time. While some video/recorded material is available free online, there are others for which NJIT procured specific streaming licenses. In no case can any of these be recorded in whole or in part. In some instances, the videos are available for an entire semester. In other situations, due to insistence with the owner of distribution rights, access to a video may be limited to a specific time like one week, which can allow you to watch the film more than once in order to get all of the information presented.

Grading

Final grade will be based on the following criteria: Level of effort and commitment, quality of work, reading assignment comprehension, class participation, project progress, timely submissions and subject comprehension as demonstrated by assignments, quizzes, exams, punctuality and attendance.

Grade distribution:

- Readings, discussions, participation in class and regular attendance: 15%
- Assignment 1: 20%
- Assignment 2: 15%
- Assignment 3: 18%
- Final Project: 22%
- Quiz 1: 3%
- Quiz 2: 3%
- Quiz 3: 4%

Required Reading

<u>Cradle to Cradle: Remaking the Way We Make Things</u>, William McDonough and Michael Braungart, North Point Press 2002

Recomended Reading

<u>Routledge Handbook of Sustainable Product Design</u>, Edited by Jonathan Chapman, Routledge, 2019

EcoDesign: The Sourcebook, Alastair Fuad-Luke, Chronical Books LLC 2002, 2004

<u>Design for Sustainability: A Sourcebook of Integrated Eco-Logical Solutions</u>, Janis Birkeland, Earthscan Publishing, 2002, 2004, 2005, 2007, 2009

<u>Design + Environment: A Global Guide to Designing Greener Goods</u>, Helen Lewis & John Gertsakis, Greenleaf 2001

<u>Product Design and Sustainability: Strategies, Tools and Practice</u>, Jane Penty Routledge, 2019

<u>Design, Ecology, Politics: Towards the Ecocene</u>, Joanna Boehnert, Bloomsbury Academic, 2018

<u>Sustainable Materials, Processes and Production (The Manufacturing Guides)</u>, Rob Thompson, Martin Rob Thompson, Thames & Hudson, 2013

<u>Biomimicry: Innovation Inspired by Nature</u>, Janine M. Bentus, William Morrow and Company, Inc. 1997

<u>Cannibals with Forks: the Triple Bottom Line of 21st Century Business</u>, John Elkington, John Wiley & Son Ltd, 1999

Unraveled: the life and death of a garment, Maxine Bédat, Portfolio/Penguin 2021

<u>An environmental life cycle approach to design: LCA for designers and the design</u> <u>market</u>, John Cays, Springer Nature Switzerland, 2021

Material value, Julia Goldstein, Bebo Press 2019

<u>Design and the real world: Human ecology and social change</u>, Victor Papanek, , Academy Chicago publishers, reprinted 2009

<u>SustainAble: a handbook of materials and applications for graphic designers and their</u> <u>clients</u>, Aaris Sherin, Rockport Design field guides, 2008

Note - There will also be a variety of **reading assignments** throughout the semester consisting of excerpts from books, periodicals, journals, and on-line articles. Reading assignments will be posted on Canvas. You are expected to check Canvas every week for posted reading material and assignments. Come prepared to engage in a round table discussion for the following class. Reading assignment materials will be referenced in Quiz questions.

Weekly Course Schedule

The weekly course schedule along with reading assignments and project assignments will be available on Canvas. Schedule and assignments are subject to change so please be sure to check frequently for updates.

Software

For the completion of Assignment #4 you will need to have the latest version of Solidworks installed on your computer.

See the following link for instructions.

https://njit.instructure.com/courses/8519/pages/solidworks-studentsfaculty

Contact Information

The culture at NJIT is a digital one. There is a lot of information online at NJIT and email is the official means of communication. This means that an administrator or teacher may inform you of critical information (like the time and place of an exam, a field trip, change in a due date for a project, etc.) via email and expect you to receive it. It is YOUR responsibility to monitor your "njit.edu" email address. You may forward the address to another email address, but MAKE SURE YOU MONITOR EMAIL COMING TO YOUR OFFICIAL NJIT EMAIL ADDRESS.

Instructor's contact Information

Email: ms3256@njit.edu