



Constructing and Performing the Self

An Interdisciplinary, Cross-Campus Collaboration combining the psychology of identity and the theater of solo performance

(days/times TBD)
Sorenson Studio Theater, Babson

This course brings together the psychological study of identity and the theater of solo performance to ask one of the most fundamental of all questions: W*ho am I*? The instructors received the inaugural BOW Curriculum Innovation Fellowship to develop the course, which will include students from all three colleges, and be offered for the fourth time this spring. In this course, theatrical and psychological approaches will be purposely inter-mingled: the questions we will ask and the answers we will derive will be informed equally by each. You will see, on a daily basis, how each field informs, supports, and speaks to the other as you oscillate between the roles of scholar, writer, actor, and critic. While we will have some class sessions and assignments explicitly grounded in only one field to build your fluency speaking their languages, the major activities of the semester will require both. The final deliverable for the course will be a short, personal monologue, informed by the scientific literature on identity, which you will write, rehearse, and then perform as part of a fully-mounted theatrical production April 11-12 in the Studio Theater at Babson.

No playwriting or acting experience is necessary (most students have none!).

Please don't hesitate to email Jon or Beth with any questions!

designed and co-taught by
Jon Adler (psychology, Olin) & Beth Wynstra (theater, Babson)
jadler@olin.edu bwynstra@babson.edu

i need more Drama

Spring 2024 AHS Course Possibilities

Dr. Anindita Basu Sempere

People and Place

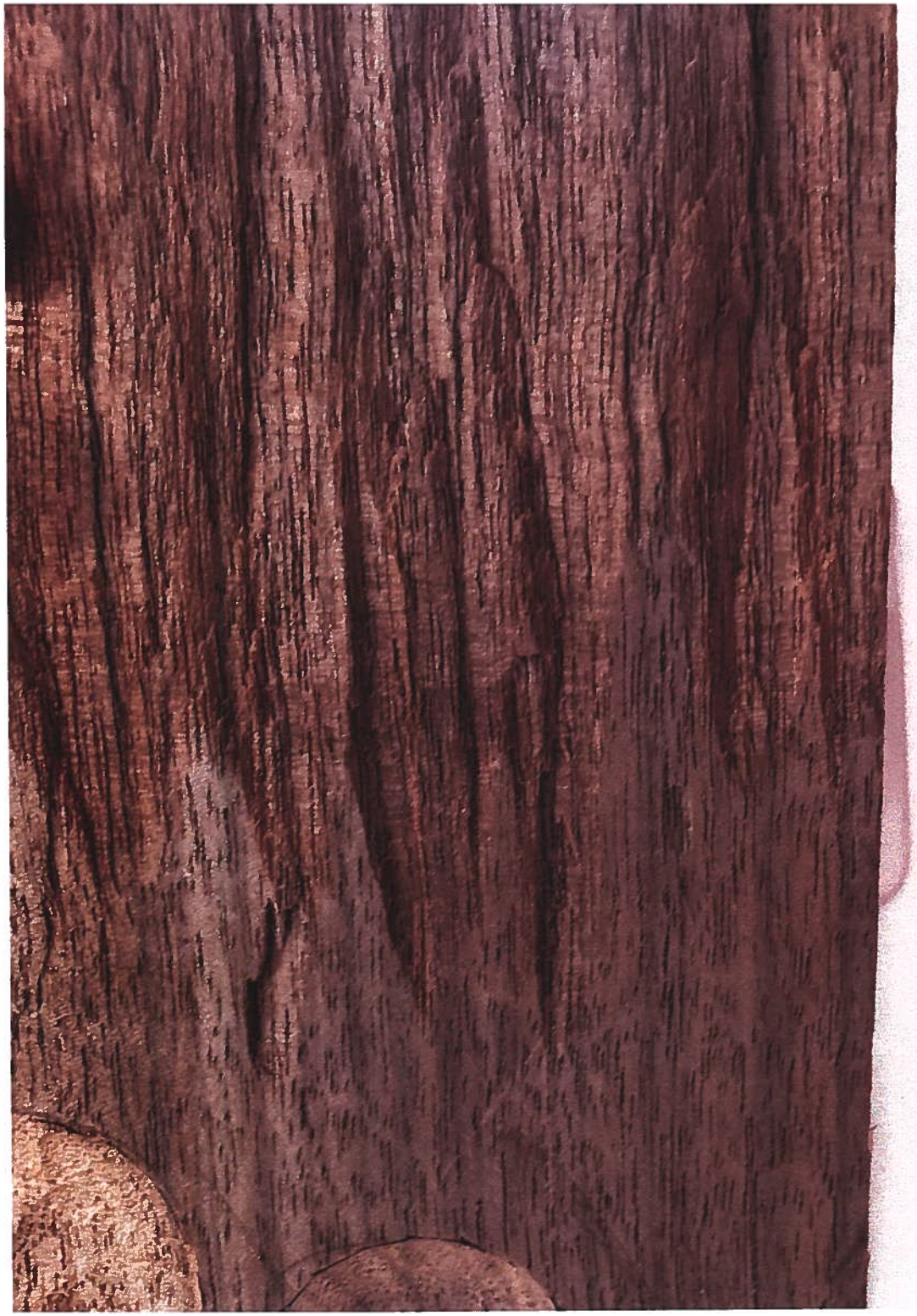
How do people and place create each other? How does moving to a new place affect our impressions of home? In this seminar, we will consider place through the lenses of cultural geography, psychogeography, phenomenology, and ecocriticism. We will also read extracts of place-based memoirs such as Annie Dillard's *An American Childhood,* J. Drew Lanham's *The Home Place*, and Aimee Nezhukumatathil's *World of Wonders.*

What is "Data" in the Humanities?

In this introduction to digital humanities (DH), we will discuss what constitutes data in DH and the affordances and limitations of using digital technologies to study humanities. We will look at three types of DH projects, discuss how data is defined in these various approaches, and use existing tools for analysis. We will study 1) museum collections and archives, 2) text analysis, and 3) deep mapping, and we will create our own DH projects as part of the course.

Children's Culture

In this seminar, we will study the history of childhood and of children's media in the US. This seminar will include readings on child development and on historic conceptualizations of childhood, and we will examine how children's media (books, toys, games, etc.) have evolved alongside our notions of childhood.

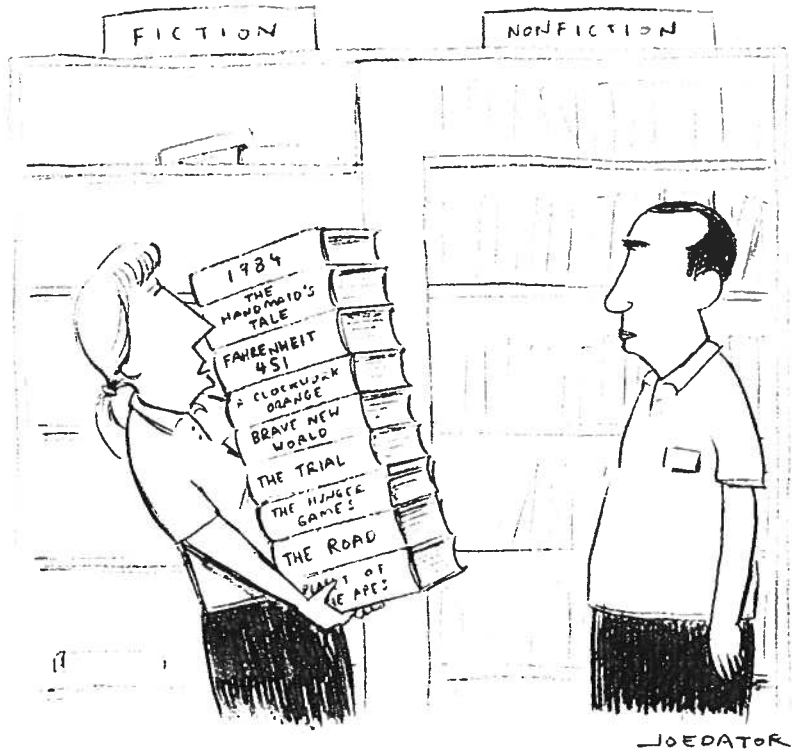


AHSE2199B: Special Topics in Arts, Humanities, Social Sciences: Form, Space, Grain: Wood as a Sculptural Medium

In this studio art course we'll explore topics in contemporary art and create works using wood as a primary medium. We'll develop a foundational understanding of wood as a material, learn to safely operate a variety of tools, and consider the context of each individuals work in the field of sculpture and contemporary art more broadly. Questions? Ideas? Reach out to Dyllan (dnguyen3@olin.edu) or stop by the Shoffice (Shop Office - MAC 105)

Fiction Gets Real.

2 AHS Credits. 6 weeks. 1 Gillian. Multiple guests.
First half of the spring semester. Stories that last a lifetime.



"Can you give me a hand moving these?"

Ever read a work of fiction you couldn't forget? Ever think about how that story impacted or changed you? Ever wonder what story deeply matters to someone you know? Then come join an exciting new 6-week adventure focused on drawing analytical and creative connections between the fiction we read and the ways we narrate and shape our lives. Connect with yourself and your Olin community through the stories that stick with us. *Each week features...*

- **Special guests**! An Olin faculty, staff, or alumni guest will join us each week to help us explore a work of fiction that stuck with them.
- **In-Class Readings**! Preferably with cookies! And comfy places to sit!
- **Analytical and Creative Exploration**! We will use analytical and creative ways to explore excerpts from selected fiction and apply them to our own life stories.
- **The chance to read *outside* your comfort zone**! We will read excerpts from works of fiction chosen by our special guests...
- **The chance to invite someone *into* your comfort zone**! The class will upvote works of fiction that matter to YOU, and student teams will dream up ways for the class to engage with the people's choice each week.

Fiction Gets Real.

2 AHS Credits. 6 weeks. 1 Gillian. Multiple guests.
First half of the spring semester. Stories that last a lifetime.

The Course:	**Fiction Gets Real**
The Instructor:	**Gillian Epstein** (*plus guest faculty, staff, or alumni partner each week!*)
The Credits:	**2 Authentic and Amazing AHS Credits**
The Timing:	**First half of the Spring semester (***6-week course)*
The Goals:	Connect with yourself and others through the fiction that sticks with us; get a chance to sample fiction you might not otherwise explore; explore analytical and creative connections between the stories you read and your own life stories; find joy in reading, thinking about and playing with fiction.

People Power: Strategies for Social Change

Semester: Spring 2024
Credits: 4 AHS
Instructor: Kofi Taha

This new, 3000-level AHS elective explores the role of power-- the ability to align interests and resources to achieve a purpose-- in creating societal change and asks what strategic lessons can be learned from social movements around the world. Through a series of case studies, we will focus on everyday people (workers, students, community members, identity-based groups) that have waged successful campaigns against seemingly more powerful governmental or corporate actors. Through careful analysis, we will distinguish between strategies and tactics, identify leverage points, and seek to find the intersection between effective action and ethical action. The course will have three parts: 1) fundamentals of movement strategy (group study); 2) strategy or case development (exploration of student selected issues, e.g., climate, prison industry, housing, etc.); and 3) collaborative design and development for an AHS Foundation course on social movements that will run in Fall 2024.

Can be used for AHS distribution requirements and in AHS concentrations.

Artificial Intelligence & Society

Spring 2024 * 4 credits AHS * Instructor: Caitrin Lynch

Course Description

This course contextualizes Artificial Intelligence within cultural conversations, ethics, and power relationships in U.S. society. The recent rise of large language models has brought to the fore ethical questions surrounding machine learning. Drawing upon academic texts as well as news articles and other forms of media, this course will explore AI as it relates to topics such as surveillance, labor, bias, trust, regulation, and more. The focus will be on these topics in U.S. society, with relevant examples drawn from other societies. Sessions for this course will involve frequent discussion as well as student presentations and guest lectures. A typical class will involve a pre-reading and journal entry before class, an instructor-led overview of the topic, an active learning activity in small groups, and a full-group discussion.

The semester will culminate in a final project, the shape of which is TBD. Options include:

- an ethics module design project to be done in collaboration with Olin instructors for use in future courses.
- a project related to AI in education at Olin and/or outside Olin
- a project related to educating a community partner group (TBD) about what AI is and why understanding it matters.

After taking this course, students should be able to...

- Critically evaluate the ethics of artificial intelligence and its societal ramifications.
- Communicate implications of AI to non-AI experts
- Articulate future implications of a new technology through writing and storytelling.

This course is a variation on the current class being taught by Caitrin Lynch, Victoria Dean, and Paul Ruvolo, which is modeled on a course called "Ethics and Robotics" that Victoria taught at Carnegie Mellon https://vdean.github.io/16-735-ethics-robotics.html

https://apnews.com/article/artificial-intelligence-hollywood-strikes-explained-writers-actors-e872bd63ab52c3ea9f7d6e825240a202

Leah Horgan, adjunct instructor is offering

ENGR2199: Special Topics in Engineering:

Critical Data Studies / Our Data Cultures:
histories, infrastructures,
& consequences

Learn more here:

DREAM

Designing Resources for Empowerment and Making

ENGR 2199 Spring Course :: Amon Millner :: Olin College

For you, the DREAM course can be like…

- ☐ Early ADE
- ☐ Impact-Centered PIE
- ☐ Excuse to escape the bubble
- ☐ All of the above++ maybe?

At Olin, students develop an understanding of how engineering can be a "people to people" process. The people who are undertaking engineering efforts and those who are affected by the outcomes are oftentimes part of complex social systems that do not serve all people equitably. DREAM students learn how to recognize and respond to inequalities in both "close-to-home" contexts and less-familiar realms. The course examines making (hands-on building with bits and/or atoms) with a critical eye toward addressing empowerment issues entrenched in maker cultures. Movements around making have established communities of people and resources aiming to support everyone feeling empowered to open and remake the engineered world around them (typically with the help of some computational, electronic, or mechanical tool). DREAM students will gain a deeper understanding of how previous and existing maker movements have leveraged hands-on learning to unify diverse sets of people and in some cases served as a divisive forces between groups. The project-based course will prepare students to identify and harness properties of tools, activities, people, and spaces for making that are designed to facilitate a group outside of Olin to feel empowered to make things, make a difference, and make their own way.

The course examines how "empowerment and making" is experienced by individuals that represent a variety of: races, colors, nationalities, ethnic origins, ancestries, ages, religions, ability levels, sexes, gender identities, sexual orientation, military involvements, and/or socio-economic statuses. Classes are structured to expose students to a variety of methods for making (with high- and low-tech) and dimensions of (dis)empowerment. The first four of five class meetings feature case studies, videos, guests and "make breaks". The class takes field trips to interesting places withing 50 miles of Boston to experience making outside of Olin's campus. Off-campus (young) makers may visit a class session to experience hands-on activities designed by DREAM students. Some assignments are assessed by outside experts, selected to represent perspectives that are not commonplace at Olin. DREAM culminates with a team project that results in a "resource for empowerment and making." Students can choose to take on challenges presented by guest speakers or partner organizations. Students are also welcome to craft their own final project trajectory, determining appropriate levels of computational, electronic, and/or mechanical components for the desired context.

ENGR2199A: Transdisciplinary Project Lens

Textiles, Global Systems, and Technology

Caitrin Lynch, Jessica Townsend
4 credits ENGR

"We solve problems with textiles."

That is the tagline of a small, sixth-generation textile mill near Olin that custom-designs textiles and fabrics for customers from a wide variety of industries. Using the textile industry (globally) and this small textile manufacturer (locally) we will explore how engineers bring their integrated technical and contextual skills to diagnose and respond to global systems where more discipline-specific approaches barely scratch the surface.

Why the textile industry?

Textiles are perhaps the most ubiquitous manufactured material in our lives and in human history. Understanding the textile industry (the technical and contextual) requires a *transdisciplinary* mindset. It is an ideal lens for an Olin engineer to explore how to engage in and impact a complex global industry and supply chain.

What to expect:

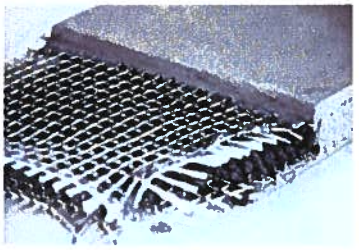
We'll examine social, economic, political, environmental, and technological topics all along the supply chain; engage in the creative and technical aspects of small-scale textile production; help students develop a systems mindset to apply to their own areas of interest in the textile industry. Finally, we'll apply all of that at a local level with projects in a family-owned textile mill facing challenges of sustainability, manufacturing, globalization, customer/client engagement (and more!).

Why would you take this class?

- You are interested in textiles and/or textile technology.
- You want to understand how an Olin engineering education can serve and support you in working on global systems and global challenges.
- You enjoy the collaborative design process and want to see what that looks like when partnering with people who are bringing a small (sometimes struggling) textiles company to the next level.

Dog beds

Paint rollers



Textile-reinforced concrete

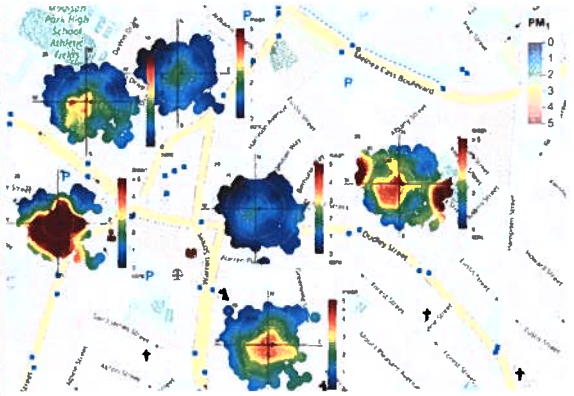
Diapers

Garments and apparel

Engr 2810
Sci 2310

Environmental Analysis and Science (EAS)

Scott Hersey



Are you interested in learning quantitative approaches to analyzing environmental systems? Curious how environmental data are collected and analyzed with lab instrumentation and software packages? Want to gain experience translating environmental insights into actionable steps for non-expert stakeholders like elected officials, advocacy groups, and residents? If you answered yes to any of those questions, you'll find a home in Environmental Analysis and Science (EAS).

EAS At a Glance

- Choose 4 credits of: SCI, ENGR, **or** Intro to Sustainability;
- 3 main course sections: a) Introduction to environmental calculations, b) air quality project, and c) water quality project;
- Activities include air quality data analysis in R, water sample collection in the field, analysis of water samples in the laboratory, written and oral communication of analysis insights to diverse audiences, in-class data workshops, and even a couple of problem sets to practice foundational material;
- Meets twice per week for 2.5 h

Engr 3360



Curious about thermo?
Hear the classes are epic?
Just need your ME thermo/transport requirements?

... then join us for:

~~**Introduction to Thermal-Fluid Systems**, Fall 2023~~ in progress
Corequisite: QEA3

KITES!

This course covers the fundamental principles of thermodynamics, heat transfer, and fluid flow as applied to engineering systems. It provides a foundation in fundamental thermodynamic phenomena, including the first and second laws of thermodynamics for closed systems, thermodynamic properties, and equations of state in ideal gases and incompressible fluids. Topics in heat transfer include conduction, convection, and resistance networks, with an emphasis on thermal modeling. Topics in fluid flow include pipe flow networks, inviscid flows, and basic aerodynamics. Students will predict the behavior of engineered systems, design kites that fly, and develop curiosity about thermal-fluid phenomena in everyday life.

HOT BOXES

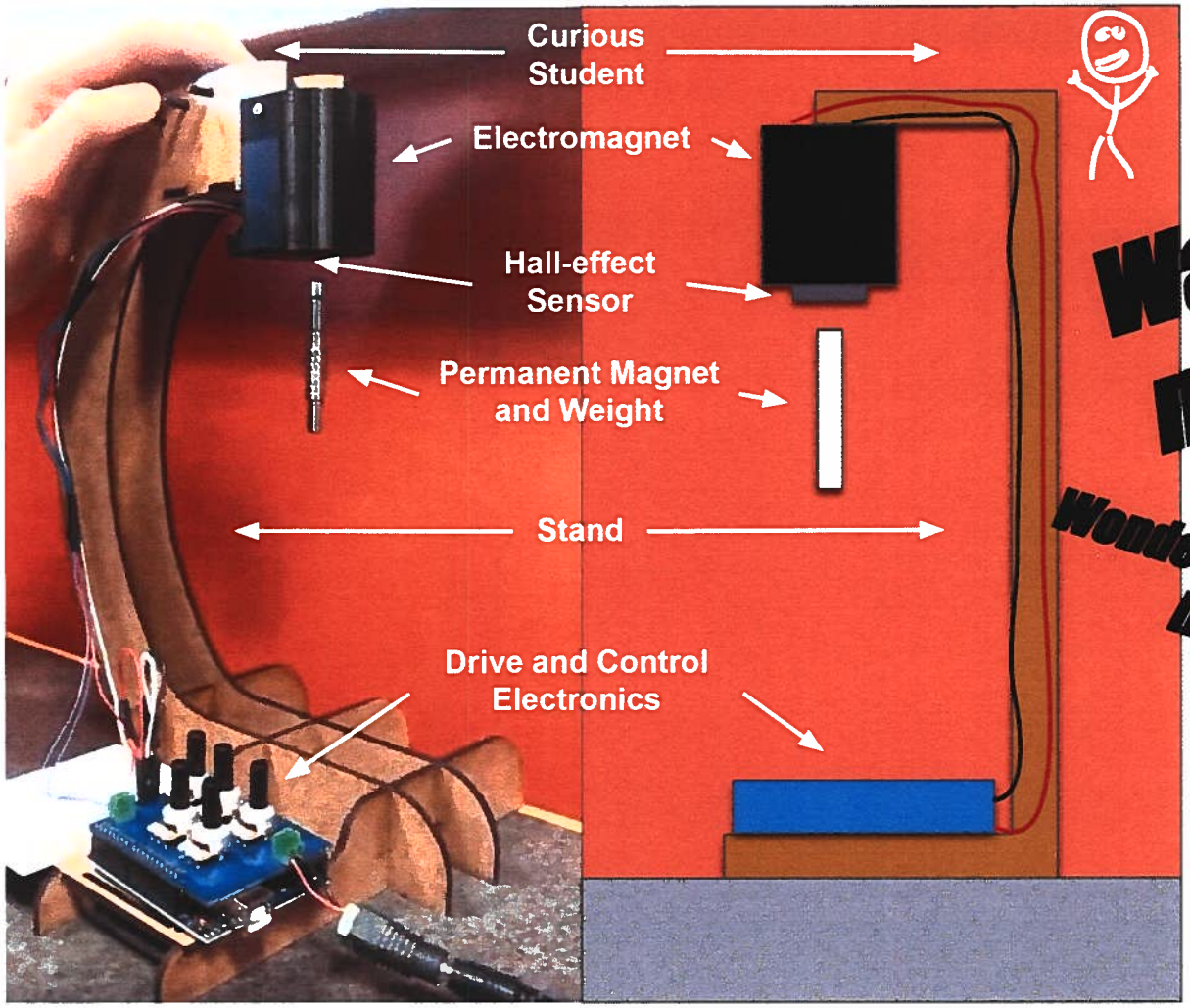
INTEGRAL !!!

HEAT PUMPS!

Thermal-Fluid Systems Analysis, Spring 2024
Prerequisite: Introduction to Thermal-Fluid Systems (or Introduction to Thermodynamics + Introduction to Transport Phenomena)

This course builds on the basic physics of energy, mass, and momentum conservation to enable analysis and design of open thermal-fluid systems. Conservation laws are used to analyze the efficiency of open non-combustion cycles, such as the organic Rankine cycle, with a particular focus on heat pumps. Students analyze heat and momentum transport using the heat equation and the Navier-Stokes equations. The pure substance model is used in tandem with heat and momentum conservation to design heat exchangers and model phase change processes. Students complete open-ended projects analyzing thermal systems of interest.

THE NAVIER-STOKES EQUATIONS!



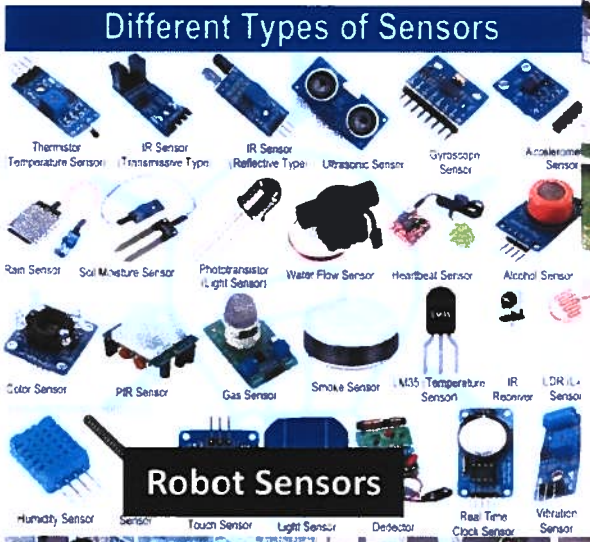
Want to levitate magnets?!?!?!

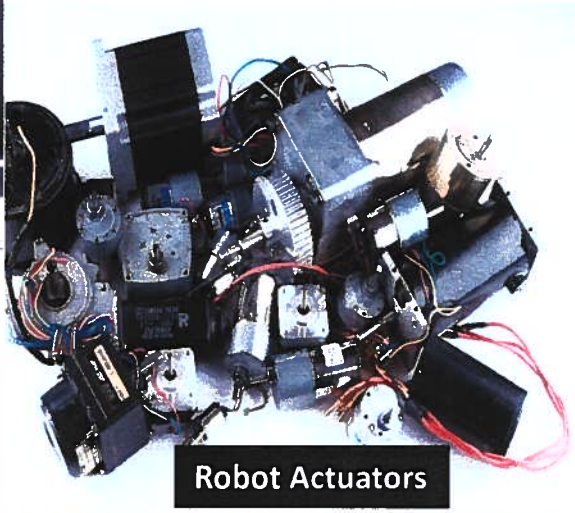
Wondering what that 1 is doing there in the last question?!?!

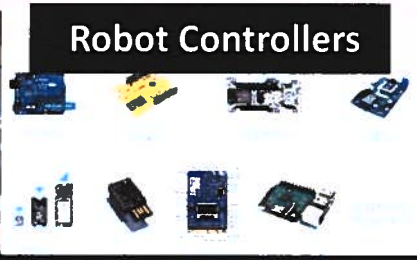
Regardless of the answers to those questions, you might want to take Feedback Control ENGR3370. Reach out to pbarragan@olin.edu if you have questions.

ENGR3390 Fundamentals of Robotics

Final Project Mission: Great Rover Oval Race, Build an autonomous exploration robot to circumnavigate Olin Oval and drop scientific payloads at research sites





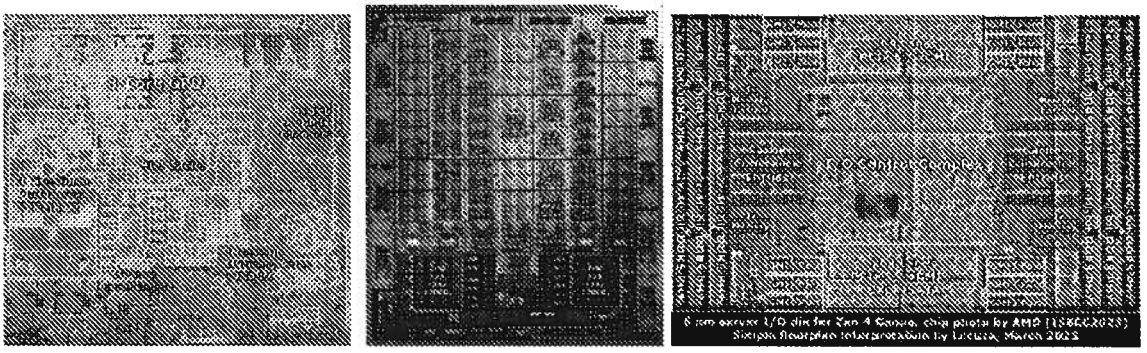


The purpose of this course is to teach the Fundamentals of Robotics. It will familiarize you with the basic subsystems that make up most robotic systems h you and will train you to both design with them and combine them into simple useful robots. The course will consist of four "hands-on" spiral design-projects that will cover; How to design, assemble and test a robot sensor system, How to design, fabricate and test a robot actuator system and How to write professional Robot-code for a fast real-time Robot. There will be a final elegant final project developing a fully integrated robot to perform a complex autonomous mission. Each segment of the course will involve teamwork, extensive hands-on lab work and review of seminal technical papers/literature. This course is very hardware based, will use MATLAB, Arduinos and Raspberry Pis heavily as its robotic software development environment. Come learn to use robots to save the world

Engr 3499A

CompArch II:
The Search for a Better Title

Come up with a punny sequel name better than what ChatGPT generated and win a prize!



Proposed course will pick up where CompArch I left off, and teach advanced architecture techniques through three projects:

Project 1: Building a CPU that can run an OS (Linux). Memory management (cache, external DRAM, virtual pages, etc), pipelining, branch prediction, and more. Will include how to build a base Linux image that is custom fit for your embedded processor.

Project 2: Building an accelerator for an existing CPU that communicates over standard protocols (PCIe or AXI4). ML inference, signal processing, etc. are all fair game.

Project 3: Open ended project: dive deeper into one topic ranging from semiconductor/electronics level to customizing compilers/optimizing

The class will also include advanced readings and discussions from academic literature and industry style app notes covering advanced hardware design and verification techniques.

Eng 3531, math 2131

Data Science With an Eye Towards Sustainability
Spring 2024 | Prof. David Shuman

Data Science

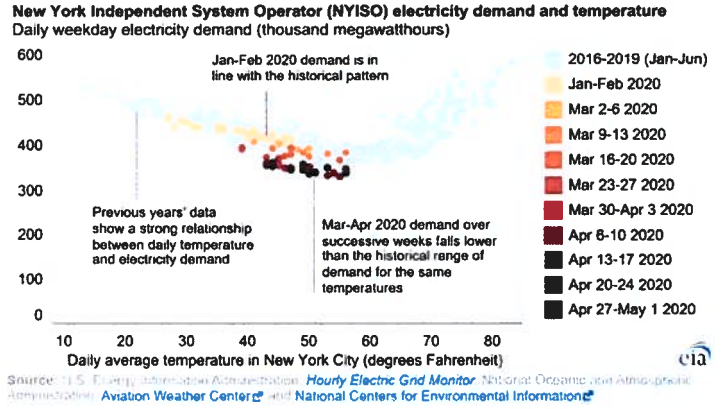
The primary learning objective of this course is to gain confidence in carrying out the entire iterative data science pipeline, from research question formulation, to data collection/scraping, to wrangling, to statistical modeling, to visualization, to presentation and communication. We'll learn and use the R/RStudio programming environment with the Tidyverse collection of data science packages. There will be a strong emphasis on exploratory data analysis, visualizations, statistical literacy, reproducible work, and storytelling with data.

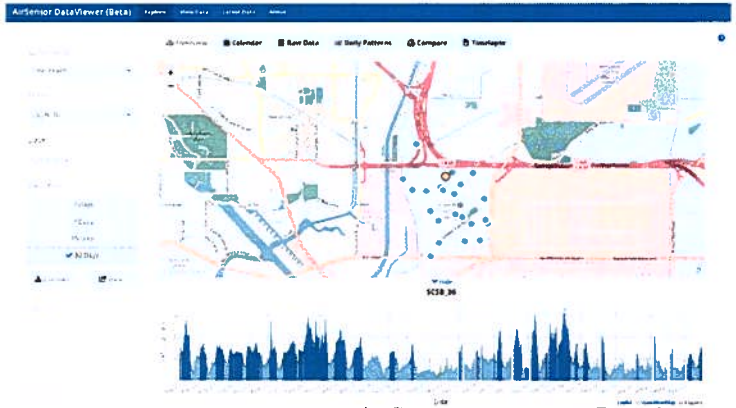
With an Eye Towards Sustainability

All data sets and projects will have some connection to sustainability. You'll have the opportunity to use data to examine:

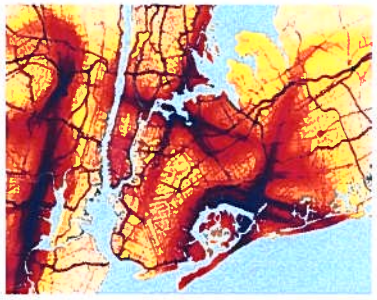
- Intersections between racial equity and climate justice
- Greenhouse gas, air quality, temperature, natural disaster, and sea level trends
- Renewable and alternative energy infrastructure investment
- Electricity demand and fossil fuel consumption patterns (including at Olin)
- Waste generation and management trends
- Management of forests and other natural resources
- Citizen-centric environmental monitoring
- Food production, food consumption, and hunger patterns
- Marine pollution
- Transportation systems
- Data warehouses
- Or any other sustainability-related data in which you are interested ...

... at micro, local, national, and/or global scales.





AirSensor open source R package.



Noise pollution map.
Source: Volpe Center

Registration Details

There are no prerequisites for this course! It is for everyone. No prior experience with coding is needed.

The course counts as 2 credits of math and 2 credits of engineering.

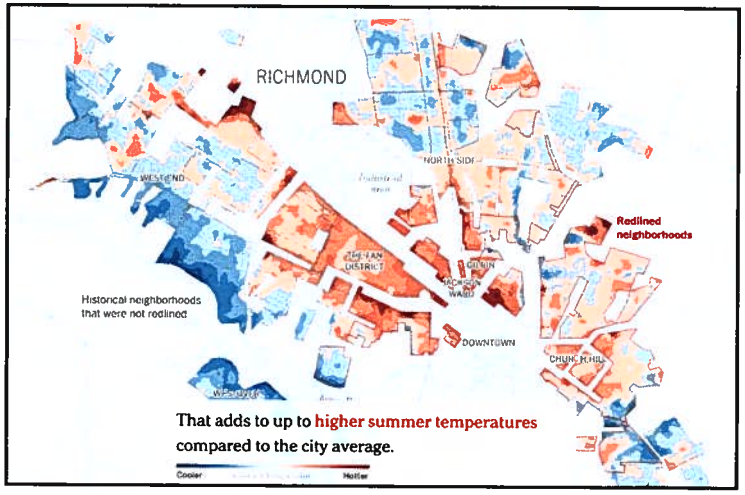
The course can count as EITHER a ProbStat elective OR an E:Sust elective OR an E:Computing elective.

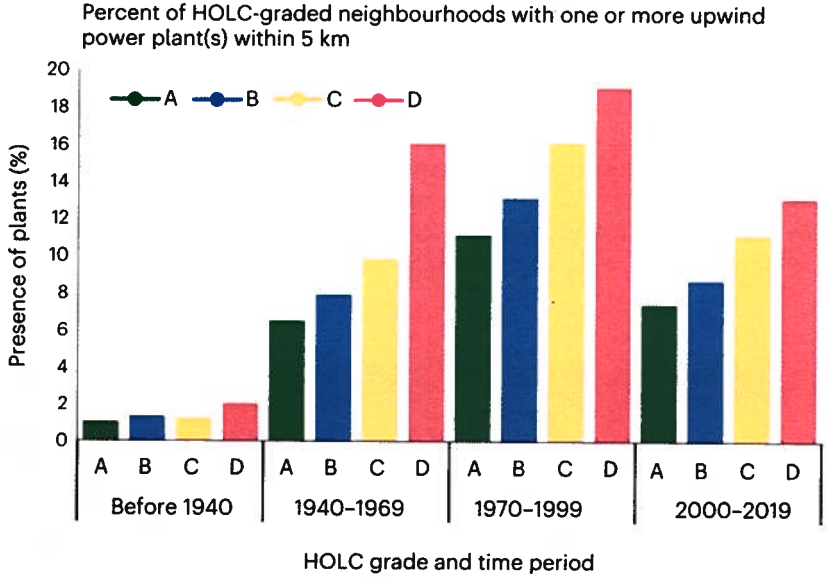
Questions?

See Prof. David Shuman or email dshuman@olin.edu.

Just a Few Examples of the Intersections Between Racial Equity and Climate Justice

The effects of racist appraisals of investment risk (red-lining) by the US Federal Home Owners' Loan Corporation in the 1930s persist today…





… and many recent policy decisions continue to exacerbate these inequities

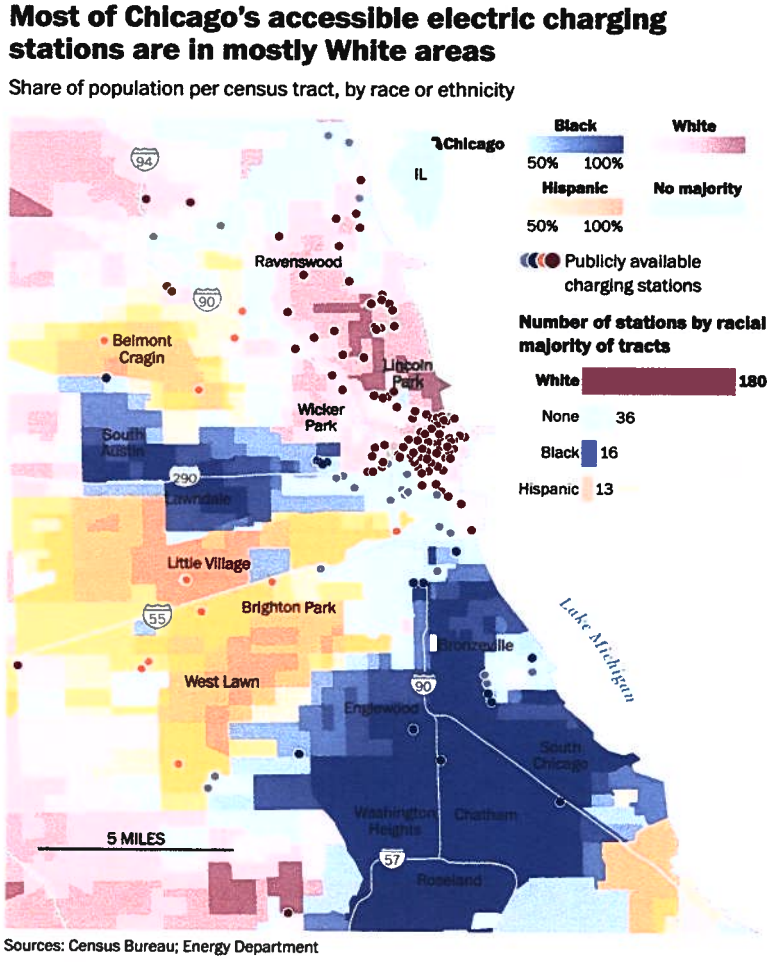


Image Sources

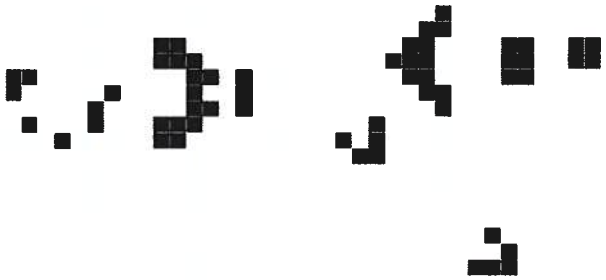
Top left: Plumer and Popovich, *New York Times*, Aug 2020
Bottom left: Cushing et al, *Nature Energy*, Dec. 2022
Right: Englund, *Washington Post*, Dec. 2021

Engr 3540

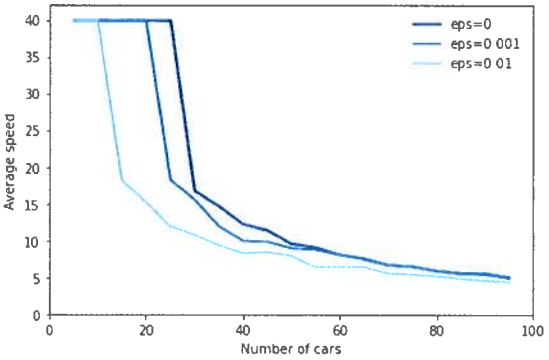
Special Topics in Computing: Complexity Science

Student-Led Course by Ben Morris and Neel Dhulipala
E:Computing elective, four ENGR credits

Complexity science is an interdisciplinary field—at the intersection of mathematics, computer science, and natural science—that focuses on discrete models of physical and social systems. In particular, it focuses on complex systems, which include networks and graphs, cellular automatons, agent-based models and swarms, fractals and self-organizing systems, chaotic systems, and cybernetic systems. This class surveys topics in Complexity Science; students will get an overview of the major areas that make up the field and read original papers that present fundamental results. The course is a continuation of ModSim with a large focus on computational science, algorithms, and modeling.



Conway's Game of Life is the most popular cellular automatons, both for studying and for play!



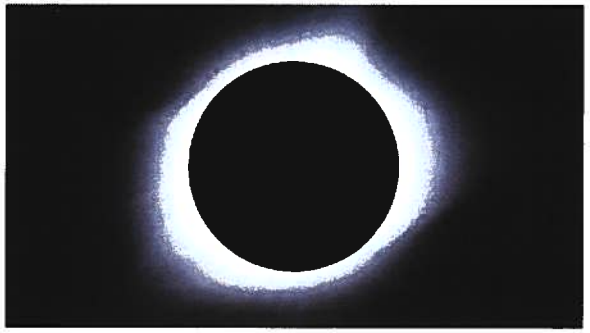
Average speed of cars in a traffic model. EPS refers to the amount of variability cars are allowed to have for their speed.

This course will:

- Survey the major areas of Complexity Science, reading both primary and secondary literature.
- Replicate previous experiments in this area and extend them in useful ways.
- Use and critique models of physical and social systems.
- Continue to develop programming skills in Python.
- Understand central questions in philosophy of science, historical responses to them, and the impact complexity science has on our understanding of models.

Spring 2024: Research or Independent Study

High Altitude Balloon System for Solar Eclipse Observations



Come to Texas in April to launch a high-altitude balloon to live stream and conduct science experiments for the total solar eclipse (next one is in 20 years).

Work Involves: software/firmware programing, electronics hardware development, long distance communication, control system design, and mechanical design

Questions ??? Talk to Chris Lee

Decision-Making in Sustainable Systems

2 MTH + 2 SCI, meets probability/statistics requirement

This class will introduce you to a variety of quantitative decision-making systems and metrics, such as benefit-cost analysis, risk assessment, and life-cycle cost analysis, to supplement the technical and entrepreneurial decision-making tools you learn elsewhere throughout our curriculum.

You'll also learn about ways that our purely quantitative decision tools fall short of representing the real world and when they are still useful ("all models are wrong..."), and we'll explore some of the reasons that decision-making is so complicated.

Decision-making content will be situated in the context of complex systems and we'll return, throughout, to the decision objective of reaching sustainable outcomes (for contextually appropriate definitions of "sustainable"). The semester will center on how we can ultimately make decisions in a world of tradeoffs, taking advantage of widely used tools along with recognition of systemic complexity, context, and the messiness of human nature.

Students have said about the course:

"I really enjoyed the decisionmaking content, and it was unlike anything I've taken at Olin."

"The switch from mathematical models of decision-making to naturalistic models was unexpected and changed my thinking quite a bit."

"The skills I learned are used on a daily basis and allow me to feel comfortable in engineering scenarios like my current internship. I did not expect this course to give me those skills, yet I am incredibly thankful for it!"

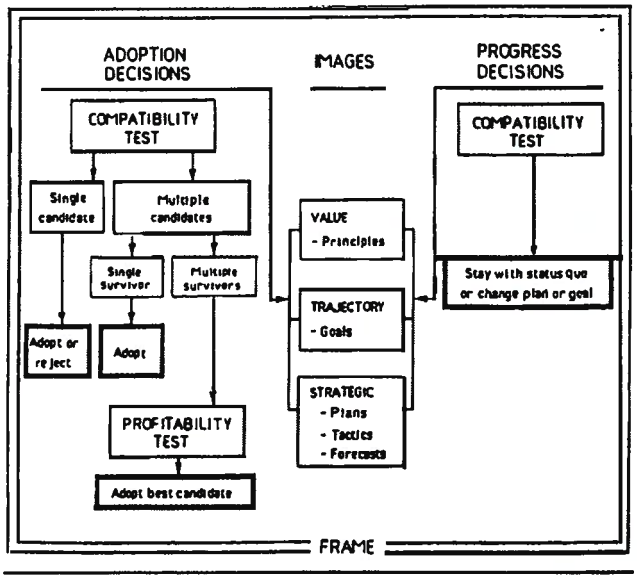
Questions? Talk to Alison (alison.wood@olin.edu)

Table 2.1 Tableau for Weighted Objective Decision Analysis

Relative Weights	w_1 w_2 ..... w_j ..... w_n	
Alternatives \ Objectives	O_1 O_2 ..... O_j ..... O_n	Overall relative utility
a_1	p_{11} p_{12} ..... p_{1j} ..... p_{1n}	$U_1 = \sum_j p_{1j} w_j$
a_2	p_{21} p_{22} ..... p_{2j} ..... p_{2n}	$U_2 = \sum_j p_{2j} w_j$
⋮		⋮
a_i	p_{i1} p_{i2} ..... p_{ij} ..... p_{in}	$U_i = \sum_j p_{ij} w_j$
⋮		⋮
a_m	p_{m1} p_{m2} ..... p_{mj} ..... p_{mn}	$U_m = \sum_j p_{mj} w_j$

a_i = The ith alternative, $i = 1$ to m.
O_j = The jth objective, $j = 1$ to n.
w_j = The relative weight of importance to objective O_j, $j = 1$ to n.
p_{ij} = The probability of attaining objective O_j through alternative a_i.
U_i = The overall relative utility of alternative a_i.

Figure 5.5. A Schematic Representation of Image Theory



Two illustrations of decision-making approaches we'll meet in class.

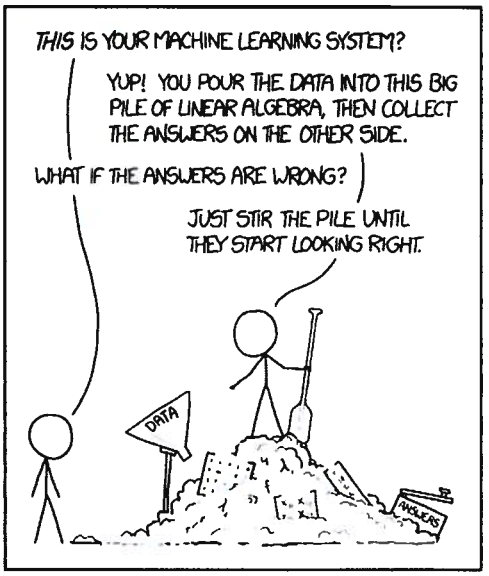
The Theory and Application of Algebraic Structures

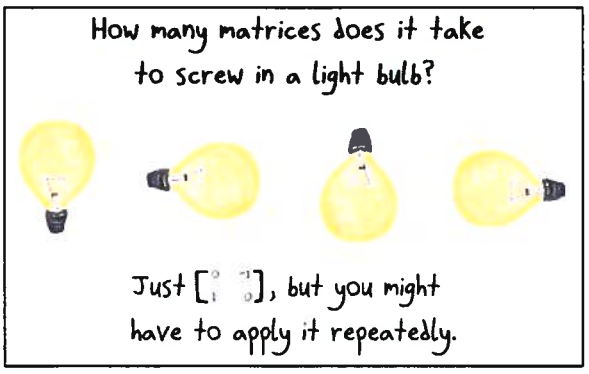
Professor Sarah Spence Adams

Math 3199: Adaptable to your major or area of interest

Did you know that machine learning is a big pile of linear algebra?
Did you know that eigenvectors helped the Loggerhead turtle population rebound in the Southeastern US?
Did you know that a recent survey of E:Robo students/alumni indicated a desire for more robotics-relevant linalg?
Did you know that modern cryptosystems & error-control codes rely on abstract algebra concepts such as Galois fields?
Did you know that ChatGPT says that mechanical engineers use linear algebraic tools such as least squares approximation, linear transformations, principal component analysis, and singular value decomposition?

In this new experimental course, students from all (or most*) majors will have the opportunity to improve their quantitative skills related to linear algebra, abstract algebra, or other algebraic structures, and apply their new learnings to applications relevant to their major or personal interests. Students will begin their quest by contacting people (e.g., industry professionals, graduate students, professors at Olin or elsewhere) working in their areas of interest to seek input on what topics in linear algebra or abstract algebra may be useful/interesting to investigate. Students will then work in small groups to plan and execute a series of projects/experiences that facilitate the learning and application of some of the suggested topics. Sporadic full-group lessons on key content or applications in linear/abstract algebra may occur, and some common homework may be assigned occasionally, however, for the most part, students will need to take initiative to articulate their learning goals and craft projects/experiences to achieve those goals.



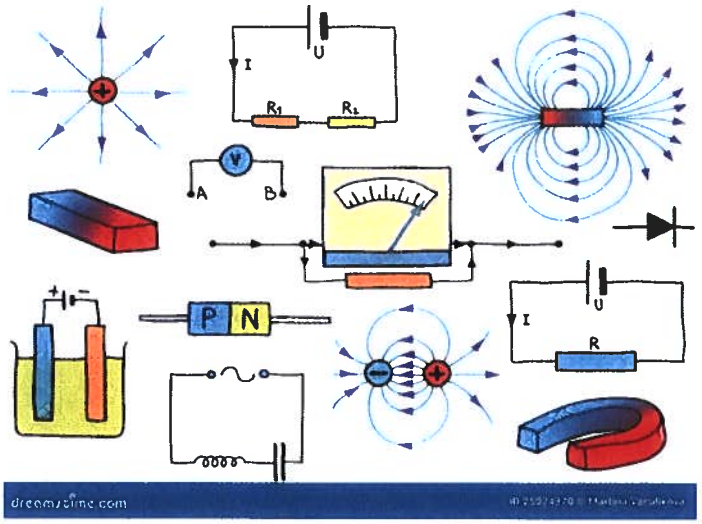


This class is a great match for students who have finished QEA and are motivated to significantly challenge themselves through setting goals and sustaining their efforts towards achieving those goals, all while learning and applying advanced technical content that they deem particularly interesting and/or useful for their own learning/ professional paths. Experimental grading (EG)** will allow students to take risks with their learning, but sustained effort and meeting learning objectives will be required to achieve the EG (as opposed to NC - no credit), so please don't assume this is a blow-off class ❤

*This course has been approved to count as the advanced math requirement for ME and E:Robo majors. For others, please ask faculty who teach in your major to confirm if this can count as a math/major requirement. Otherwise, enjoy this course as a useful elective that can be made relevant to nearly any area of interest!

**Experimental Grading means that you will receive an EG on your transcript if you meet the learning objectives and an NC (no credit) otherwise. EG courses can count for your major but do not impact your GPA.

Comics taken from http://xkcd.com, https://mathwithbaddrawings.com/, and https://curiosamathematica.tumblr.com/



SCI1199: Special Topics in Physics: Electricity & Magnetism

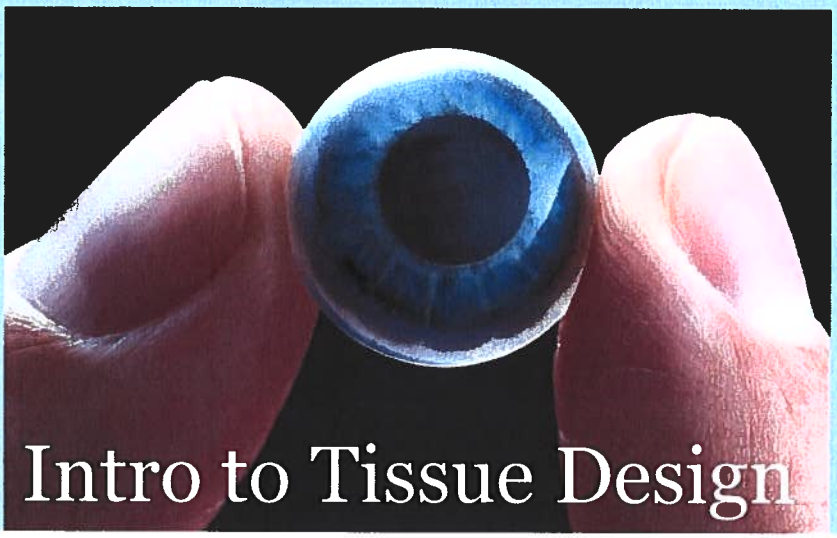
Instructor(s): Andy Neely
Credits: 4 SCI **Hours:** 4-0-8

This course fulfills the multivariable (vector) calculus requirement for graduation. ***It may be taken instead of QEA 2***. *Note* that this course does not give math credits (whereas QEA2 is 2 credits of MTH, 1 credit of SCI, 1 credit ENGR). Students are responsible for meeting the minimum math and science requirements and taking QEA 3 if appropriate for their major or concentration.

Course Description: Students will work individually or in small teams on in-class activities including measurements and hardware; and may apply general simulation tools (e.g., COMSOL). The final project is to build a physics demonstration project that could be used for a future class. Topics covered in the context of mathematics from vector calculus include electric charges, forces, and fields, Gauss's Law, potential, electrostatic energy and capacitors, magnetic fields and energy, mutual and self-induction, Ampere's Law, Maxwell's Equations and electromagnetic waves.

How Do We Build an Organ? Are we playing at Being Gods? Have we surpassed the "Frankenstein" model?

SCI1299: Topics in Foundational Biological Sciences



Although the ideas of regrowing limbs, replacing tissue and organs, and bringing people back to life has been the stuff of myths and legends, and more recently science fiction, it is now our reality. What seemed impossible just in the latter part of the twentieth century is part of our everyday life. We now possess the means, for the first time in human history, to alter the very genetic structure of life. This represents enormous potential and with it, enormous responsibility, because the direction we go in, and the choices we make, can change the course of humanity.

In this course we will learn the foundation of biological principles and apply them to the field of tissue engineering. A large part of this course will be spent in the laboratory learning the basics of the field. In addition, we will have guest speakers who are working in the field, who will provide unique perspectives on their work and the field in general.

4 Credits Science

In this hands-on course, you'll:

- Learn tissue culture techniques
- Formulate hydrogels for sustained-release mechanisms
- Do recombinant DNA transformation

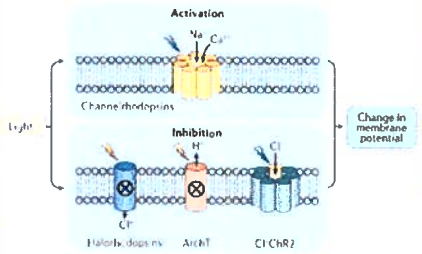
Michael Fannon
mfannon@olin.edu

Light and Life

A new course at Olin College, Spring 2024
Jean Huang & ECE Faculty

Spring 2024
Pre-requisites: none
Credit: ECE/SCI foundation biology





"Light and Life", is an interdisciplinary exploration of light and its interaction with biological systems in the context of medicine (diagnoses and therapeutics) and environment (assessing the health of land, water, air, and the interaction with biological systems and sustainability). We will explore the technical, societal and environmental intersections of these fields. The course includes a laboratory project on the redesign of a more equitable pulse oximeter, which is one of the myriad light-based medical devices commonly used. We will additionally explore the application of light interaction with bacteria and plants through experience with optogenetics (light activation of gene expression) and technologies for monitoring plant and ecosystem health. This course unites fields of electrical and computer engineering and the life sciences, will facilitate the understanding of socio-technical systems involved, and prepare students to apply this knowledge and design for these applications in the real world.

Contact: Jean Huang (jean.huang@olin.edu), for the teaching team

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