My Team and Me: Team Contracts to Support Inclusive Teaching and Learning

Thursday, February 9, 2023 • 9:10 AM – 10:00 AM
Location: Building 192, Room 321

Presenter: Kira Abercromby
Professor, Aerospace Engineering (she,her,hers)

Nothing in Aerospace (or engineering in general) gets designed or built without a team. Likewise, in the classroom many projects, labs, and research are conducted in teams. However, team dynamics are not always equitable and student identities can impact their experience on a team. For example, not everyone on the team has the same kind of free time or the same style of working, so communicating is the cornerstone for a positive teamwork experience. As instructors, although we normally provide explicit instruction to understand mathematical concepts, there was an expectation that students would know how to productively work in a team without explicit instruction or discussion.

As an instructor, I have made a pedagogical decision in my Intro to Aerospace Engineering course, to make space to hold discussions regarding what it means to be an inclusive team member, what are ways to make each person's voice heard, how they were going to deal with heated discussions, and when it is appropriate to involve the instructor. The intention of this work is to provide students with more tools to build successful teams where everyone can succeed and feel included in the learning. Following this discussion, students spend time in their lab groups creating a team contract, building on the discussion from the classroom with specific solutions for their individual groups. This process is formalized as an aspect of my course, and includes the submission of the team contract as an assignment, and a self-evaluation reflecting on their team and their teamwork. The overall goal is to increase inclusive team practices to support learning for all students via explicitly making class time for discussions about teamwork, and promoting practices to involve all students in the team, and to recognize that inclusive teamwork takes practice, just like everything else.

Increase Justice and Reduce Oppression in Student-Led Community-Based Engineering Development Projects and Practices

Thursday, February 9, 2023 • 2:10 PM – 3:00 PM
Location: Building 192, Room 321

Presenters: Liz Thompson (she/hers), General Engineering, and **Jane Lehr** (she/they), Professor in Ethnic Studies and Women's, Gender and Queer Studies

This workshop introduces, interactively explores, and evaluates an approach to increasing justice and reducing oppression in student-led community-based engineering development projects and practices. Developed, implemented, and tested in a co-curricular context by Cal Poly alum Michael Reyna in their master's thesis, this approach draws from Design Justice (Design Justice Network; Costanza-Chock, 2020), feminist qualitative science & technology studies, Latin American decolonial theory, and critical participatory action research. Workshop participants will engage in hands-on practice with this approach and will be invited to collaboratively crowd-source additional tools, frameworks, and practices for creating and sustaining more just and transformative partnerships between engineering students and community partners in local, national, and multi-nation contexts.

Thriving in the College of Engineering — A Student's Perspective

Thursday, February 9, 2023 • 9:10 AM – 10:00 AM PST
Location: Building 197, Bonderson, Room 104

Presenter: Zoë Wood, Associate Dean of Diversity and Student Success

A panel of student leaders from CENG clubs discuss challenges and opportunities for thriving in engineering for students with diverse backgrounds and identities.

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Incorporating Social Justice Projects into Thermodynamics …

Thursday, February 9, 2023 • **8:10 AM – 9:00 AM PST**
Location: Building 192, Room 321

Presenter: Jennifer Mott
Assistant Professor, Mechanical Engineering (she, her, hers)

Topics and assignments related to social justice are being integrated into thermal systems design and thermodynamics courses with the goal of disrupting the social/technical dualism present in engineering curriculum that often discourages engineering students from learning about and participating in social justice issues and discussions. Using a modular four-step process the social justice assignments have students do engineering analysis while at the same time think about the impact of the engineering technology on different groups of people. This presentation will give examples of the assignments, talk about the student reception and instructor's experience and tips.

Encouraging Sociotechnical Connections in Engineering Science Courses

Thursday, February 9, 2023 • **10:10 AM – 11:00 AM PST**
Location: Building 197, Bonderson, Room 104

Presenter: Ben Lutz
Assistant Professor, Mechanical Engineering (he, him, his)

Evident in calls such as the NAE Grand Challenges, UN Sustainable Development Goals, and numerous guest editorials, current and future engineering problems are fundamentally sociotechnical. That is, these problems both shape and are shaped by social, cultural, political, environmental, and other contexts in ways that are vast and complex. Engineers work on problems in, for example, healthcare, environmental protection, transportation, and others that involve complex interactions between diverse systems and stakeholders. And while engineering almost always entails sociotechnical thinking, most engineering science courses are taught in ways that minimize—intentionally or otherwise—the ways in which technical content can connect to contexts and experiences beyond the classroom. This presentation will share some preliminary findings from different interventions in an engineering statics course to help students make connections between course topics and broader social, cultural,

environmental, personal, etc. dimensions that are relevant to their lives. In particular, I will present findings in the form of student passages from a "problem redesign" assignment as well as a Utility Value Intervention. I will highlight the different ways that students make connections to course concepts and encourage a rich discussion around potential approaches for integrating sociotechnical topics into other engineering science courses.

Integrating Social and Environmental Justice into the Program Educational Objectives of Cal Poly's Civil and Environmental Engineering Department

Thursday, February 9, 2023 • **3:10 PM – 4:00 PM PST**
Location: Building 192, Room 321

Presenters: Rebekah Oulton and **Amr El Badawy**, Civil & Environmental Engineering

After the murder of George Floyd in May 2020, an undergraduate student coalition in the Civil and Environmental Engineering (CE/ENVE) Department at California Polytechnic University San Luis Obispo proposed that the curriculum be updated to address the topics of social and environmental justice and their role in Civil and Environmental Engineering. As a result, the CE/ENVE faculty collaborated with the student leaders to integrate social and environmental justice into the CE/ENVE program educational objectives (PEOs). PEOs reflect the goals that program graduates will achieve within a few years of graduation, reflect the mission of the Department, and provide guidance for specific student learning outcomes in the classrooms. As such, they are the principle tool for guiding lasting and significant modifications to the curriculum. As part of the student-initiated PEOs revitalization, additional educational objectives were incorporated, including: resilient, sustainable, and safe design; systems-thinking; and, inclusive communications.

This update of the PEOs is a critical step towards re-shaping the CE/ENVE curriculum to educate the students about social justice and its strong connection to engineering design and practice. The new PEOs will result in a modern CE/ENVE curriculum that helps students develop the knowledge and skills needed to address the contemporary challenges facing the world. This presentation discusses the bottom-up, student-centric process used for updating the CE/ENVE PEOs, the stakeholders involved, and the students' key contributions to the process. The focus of the work encompasses the challenges encountered during this experience and the lessons learned. Additionally, this presentation including specific examples of implementation of the PEOs into selected courses and development of appropriate activities and assignments.

DEI in STEM: "Creative Destruction"

Thursday, February 9, 2023 • **8:10 AM – 9:00 AM PST**
Location: Building 10, Room 231

Presenters: Arnold Deffo, Aerospace Engineering, and **Michael Whitt**, Biomedical Engineering

Conventionally, 'creative destruction' is defined as the dismantling of long-standing practices in order to make way for innovation primarily for capitalistic ends. This workshop will explore examples of racial and gender disparities within STEM and discuss how we as members of the Cal Poly community can make positive change on our campus and beyond.

Advances in Research Collaboration

Thursday, February 9, 2023 • **1:10 PM – 2:00 PM PST**
Location: Building 192, Room 321

Presenters: Mugizi Rwebangira (he/his) and **Theresa Migler** (she/hers), Computer Science and Software Engineering

We compare the collaboration networks at a research focused university (UCSB) compared to a teaching focused university (Cal Poly). We are particularly interested in the effects of gender and ethnicity and on how the adoption of the teacher-scholar model has changed things at Cal Poly. Our examination shows that over the last 30 years, Cal Poly has seen relatively more growth in researchers and their corresponding collaborations each year than UCSB. This early analytical work appears to show that the teacher-scholar model has positively impacted the overall research and collaboration community within Cal Poly.

Machine Learning in Precision Medicine — Promises and Pitfalls

Thursday, February 9, 2023 • **2:10 PM – 3:00 PM PST**
Location: Building 33, Room 258

Presenters: Jean Davidson Asst. Professor of Biological Sciences, (she/her), and **Paul Anderson** Assoc. Professor of Computer Sciences, (he/his)

How computational biology has the potential to radically improve equity and access to precision medicine, but also can reinforce exclusionary social establishments.

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