



LAFAYETTE

ENGINEERING

FEBRUARY 2024

— NEWS & ADVANCEMENTS —

CELEBRATING NATIONAL ENGINEERS WEEK

FEBRUARY 18—24

Greetings from the Dean

The spring semester is underway and we're hard at work here in Acopian Engineering Center with engineering students studying abroad in high numbers once again, exciting new projects and lab work taking place, and a fantastic lineup in store for National Engineers Week! We hope you'll take a moment to see some of the highlights we've collected here, and connect with us at the upcoming events.

Lauren S. Anderson '04
William A. Jeffers Dean of Engineering



Beyond the Books

At Lafayette Engineering, students are immersed in hands-on activities with real-world applications. Whether dynamic class projects, research endeavors, fieldwork, or community initiatives, the emphasis is on learning by doing. This active learning not only fosters students' critical analysis and

synthesis, it helps spark their intellectual curiosity, discover their passions, and fuel their ambitions. Here are just two examples.

Students in Walter A. Scott Chair of Integrative Engineering David Brandes' Environment and Energy Systems Engineering class are involved in



an exciting project with Arvoredos Island off the coast of Brazil. This fully sustainable site was developed by Lafayette alumnus Fernando Lee Class of 1924 in the 1950s as a demonstration site for sustainable water, energy, and food sys-

Beyond the Books continued

tems. The infrastructure at the site is in need of refurbishing and students will be working with the INMAR Foundation, which oversees the island, to develop preliminary design plans for system upgrades focusing on the rain-water collection and treatment system in particular. With support from the Fund for Education Beyond the Classroom, an endowment fund established by Walter “Bud” Scherr ‘78, the class will travel to Ilha do Arvoredo during spring break to gather information and collaborate more directly with INMAR staff.

Working with Assistant Professor of Civil & Environmental Engineering David Mante in the Lafayette College Concrete Laboratory (LCCL), students Zoe Ohl '25 (pictured), Sean Walshe '25 (pictured), and Omar Soto '24 are conducting full-scale laboratory testing on bridge joints for concrete bridge decks for PennDOT. Mechanical Engineering Professor Jeff Helm is assisting with the instrumentation of the test article, including measurement of the deflection of the bridge joint using digital image correlation. Highway bridges need strong decks to carry cars and trucks. Usually, these decks wear out after 20 to 30 years, and they either get replaced using traditional cast-in-place construction or with pre-made concrete panels. For prefabricat-

ed concrete deck panels to be viable, connections between deck panels must remain simple and efficient, but also emulate the structural behavior of a traditional cast-in-place bridge deck. The ultimate goal of the team’s project is to propose enhancements to the existing PennDOT precast deck panel joints. The joint simplification will significantly reduce the cost of bridge deck replacement projects within the Commonwealth, as well as reduce the downtime the traveling public experiences during bridge deck replacement projects.

These and other exciting opportunities for students are made possible through generous support from alumni and friends of Lafayette Engineering.



Elevating Education at Lafayette Engineering

Lafayette Engineering faculty understand that learning is a life-long journey, constantly seeking to enhance their expertise and enrich the educational experience for students. Our commitment to excellence and adaptability extends beyond the boundaries of classrooms and labs, as demonstrated by the participation of over two-thirds of our engineering faculty in the Center for the Integration of Teaching, Learning, and Scholarship (CITLS) programming this past year.

Driven by a passion for discovery and innovation, our professors serve as inspiring mentors who not only impart knowledge but also cultivate a culture of curiosity and continuous growth. Their dedication to staying at the forefront of their fields ensures that our students receive the highest quality education, while their unwavering support and encouragement empower every student to thrive in their engineering pursuits.

Inclusivity is not just a value—it's a guiding principle that shapes our approach to education. By fostering an environment where diversity is celebrated and every voice is heard, we strive to create a community where everyone feels welcomed, supported, and empowered to succeed.

This past summer, the Mechanical Engineering Department participated in the CITLS Inclusive Instructors Academy. Faculty members attended monthly meetings, read materials on inclusive teaching, discussed research-supported strategies for inclusion, developed goals for inclusion for the semester, implemented strategies, and



discussed and obtained feedback on their efforts with colleagues and student partners. This work resulted in a handbook for students, *Effective Teaming: A Resource Designed for and with Lafayette Students*, written by CITLS and the Hanson Center for Inclusive STEM Education, and is continuing this academic year. (See photo above, courtesy of CITLS.)

Civil and Environmental Engineering professors Mary Roth and Christa Kelleher collaborated to review and improve support for civil engineering students with respect to inclusive teamwork. The civil engineering curriculum “bookends” discussions with students on teamwork by introducing teamwork in CE 271 at the start of the sophomore year and then by formally revisiting teamwork as a topic during the students’ capstone experience in CE 474/475. Professors Roth and Kelleher collected data on students’ understanding of desirable teamwork skills and of characteristics of effective teams at the start of the fall 2023 semester in both CE 271 and CE 474. They then introduced additional information and in-class experiences related to inclusive teamwork to

both courses during the semester. They will share what they learned regarding students’ understanding of inclusive teamwork with the department during the spring 2024 semester.

For the second year, students in chemical engineering capstone, CHE 422 Design Synthesis, are collaborating with WGSS 250 Gender and STEM led by Mary Armstrong, and working with the Hanson Center for Inclusive STEM Education. Students will watch *Picture a Scientist*, a 2020 film highlighting gender inequality in STEM, then reflect on the film through prompts in multidisciplinary groups of students from both classes.

Several engineering faculty members also participated in the Hanson Center’s fall reading group, which spent the semester discussing articles written by the Center’s inaugural Visiting Scholar Dr. Michelle Smith, Ann S. Bowers Professor of Ecology and Evolutionary Biology and Senior Associate Dean for Undergraduate Education at Cornell University. The group covered a range of topics such as student expectations in introductory STEM courses, the impact of active learning in STEM, and how best to

Elevating Education continued

support students' transition from high school to college. The group also read the National Academies of Sciences, Engineering, and Medicine (NASEM) consensus draft report on Effective and Equitable STEM Teaching and submitted feedback to the committee. (See photo at right, courtesy of the Hanson Center for Inclusive STEM Education).

Beyond the commitment to ongoing professional development and teaching excellence, Lafayette



Engineering faculty members consistently strive for excellence in their scholarly endeavors, producing groundbreaking research and

garnering recognition for their many contributions.

National Engineers Week

February 18-24

Join us in person or via Zoom as we celebrate the impact of engineering on our interconnected world. Details on National Engineers Week presentations and events, and registration for Zoom links are on the website:

<https://engineering.lafayette.edu/engineers-week/> or use the QR code at right.



Tuesday 2/20, 12:00pm - 1:00pm in AEC 505

Preserving a Legacy of Sustainability on Ilha do Arvoredo, Brazil

William A. Jeffers Dean of Engineering Lauren S. Anderson '04



Wednesday 2/21, 12:00pm - 1:00pm in Skillman 206

Education as Freedom: A Transformational New Framework for Engineering Education

Assistant Professor of Engineering Studies Sarah Appelhans



Wednesday 2/21, 4:15pm - 5:00pm in AEC 511

Hate Detours? Learn about the Lafayette College Concrete Lab's Research to Streamline Bridge Repairs

Assistant Professor of Civil Engineering David Mante



Friday 2/23, 12:00pm - 1:00pm in RISC 362

What We Talk About When We Talk About Race and Technology

Baird Professor of Mechanical Engineering Jenn Stroud Rossmann

