Cal Poly Pomona

College of Engineering
INDUSTRIAL AND MANUFACTURING ENGINEERING

Academic Year 2024-2025 Newsletter

Greeting from the Department Chair

As Chair of the Department, I am excited to share the tremendous progress we've made this year toward modernizing and enhancing our academic programs and facilities. Our department has been actively focused on revamping both the Industrial Engineering and Manufacturing Engineering curricula. With valuable feedback from industry partners, alumni, and academic colleagues, we are aligning our programs more closely with current and future workforce needs.

A new initiative has been the integration of artificial intelligence (AI) tools into our courses, supported by a recent grant. This effort will better prepare our students to apply AI in engineering contexts, particularly in data-driven decision-making and automation.

In addition to our curriculum efforts, we are proud to be *pioneering a new Master of Science of Artificial Intelligence in Engineering*—a multidisciplinary program currently under development in collaboration with all departments within the College of Engineering. This innovative program will offer advanced training in AI methods and their application across diverse engineering domains.

We have also made significant strides in upgrading our facilities. We successfully opened our revamped automation laboratory—**Vy and Tim Li Automation Lab**—on May 1st. The lab equipment was fully installed by the end of December 2024. Training in the lab began in January, and we look forward to expanding the training

and the system capabilities in mid-May. We also acquired a new plastic injection molding machine and several new welding machines to enhance hands-on learning. These investments reflect our deep commitment to providing students with a modern, industry-relevant engineering education. Thank you for being part of our journey as we continue to innovate and grow.

Warm regards,
Shokoufeh Mirzaei
Chair, Department of Industrial and Manufacturing Engineering

Vy and Timothy Li Automation Laboratory

On May 1st, the Industrial & Manufacturing Engineering (IME) Department proudly celebrated the opening of the new **Vy and Timothy Li Automation Laboratory**, a cutting-edge space designed to support hands-on learning, automation, and smart manufacturing research. The lab was made possible through a collective investment of approximately $850,000, combining a generous donation from Tim and Vy Li, a National Science Foundation grant, support from the SPICE program, and Cal Poly

This collaborative funding effort was led by Dr. Shokoufeh Mirzaei and Dr. Ellips Masehian enabled the department to upgrade its facilities with state-of-the-art equipment aligned with Industry 4.0 technologies. The new lab supports core instruction, senior projects, and student-led research in manufacturing systems and smart automation, directly engaging hundreds of students across the Industrial and Manufacturing Engineering programs. These investments mark a major milestone in the department's goal to equip students with the skills and experiences needed to lead in the future of manufacturing.

Valedictorians

Congrats to this year's Valedictorians and Salutatorian for Industrial Engineering and Manufacturing Engineering. It's no easy feat to have the highest GPA for your program, and it's even harder to have the highest GPA among the Class of 2025.

Martik Bedrosian (**Valedictorian -** Industrial Engineering)
Jordan Sycip - *Right photo* (**Salutatorian -** Industrial Engineering)
Aryan Patel - *Left photo* (**Valedictorian -** Manufacturing Engineering)

Angel Cervantes (**Salutatorian -** Manufacturing Engineering)

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Research and Innovation

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System Science for Social Impact

Dr. Saeideh Fallah-Fini is concluding the second year of two federally funded research projects (supported by NIH and HHS) addressing the alarming rise in severe maternal morbidity (SMM) and cardiovascular SMM among non-Hispanic Black women. Using participatory systems science methods, her team has engaged patients, healthcare providers, and policymakers to uncover the systemic drivers of these disparities. A major outcome this year is a validated simulation model that projects future prevalence rates and evaluates the impact of policy interventions. In parallel, Dr. Fallah-Fini received support from Lockheed Martin to incorporate Model-Based Systems Engineering (MBSE) into the undergraduate curriculum, equipping students with the tools to analyze and design complex systems, while preparing them for the demands of today's engineering landscape.

AI in Flight, Innovation in Fabrication

Dr. Dayue Jiang and Dr. Shokoufeh Mirzaei are leading two cutting-edge research projects funded by the Air Force Research Laboratory through the PACER grant initiative. Dr. Jiang's work focuses on advanced additive manufacturing using pellet-based extrusion (P-MEX) to produce high-performance metals and ceramics for aerospace and energy systems. His research integrates high-temperature sintering and multi-scale simulation to optimize material performance and manufacturing efficiency. Meanwhile, Dr. Mirzaei is developing autonomous mission control systems for UAVs navigating uncertain environments, such as communication loss scenarios. Her team applies advanced AI sequence modeling—using GRUs and Informers—to predict UAV trajectories and enhance flight autonomy. Together, their work is advancing the future of intelligent aerospace systems and manufacturing technologies.

Research in Action, Students in the Spotlight

Professor Okhuysen presented a paper titled "Benchmarking Shell Recycling, Productivity Metrics, and Risering Practices in the North American Investment Casting Industry." This paper was requested for a second presentation to the Investment Casting Institute for their October technical meeting as well. He also secured funding for travel for 17 students to the Cast In Steel competition and AFS Cast Expo in April. Our students will be highlighted in a new TV miniseries on the Cast in Steel competition anticipated in Falll 25 or soon thereafter. Professor Okhuysen coauthored a paper with two undergraduate students, Valerie Castillo and Saulo Garcia titled "Use of Recycled Glass in Investment Casting of Aluminum" for presentation at the World Conference in Investment Casting in September.

From Research to Product:
Techeeta Aims to Reduce Sports Injuries

Dr. Payam Parsa is advancing a promising research project, **Techeeta**, through the NSF I-Corps program to explore its potential for real-world impact. Techeeta uses machine learning to support injury risk assessment in soccer players, with the goal of helping athletic staff make more informed decisions. This research is being supported through partnerships with both professional and collegiate teams in the U.S. and abroad. The project is highly collaborative, bringing together data scientists, medical doctors, and sport scientists from soccer and basketball to ensure the technology is both scientifically rigorous and practically useful. Through the I-Corps program, the team is focusing on customer discovery and business model development to better understand how this technology can serve key stakeholders. This effort marks an important step toward bridging research and application, and the team welcomes future collaborations with those interested in sports performance, injury prevention, or health-focused technologies.

Alumni Voices: Guiding the Next Generation

To strengthen student career readiness and alumni engagement, the IME Department launched the "**Alumni Panel Series**," featuring alumni from a range of industries who shared career insights and advice on navigating early career challenges. This spring, the series included alumni from Mattel, Northrop Grumman, and Boeing, providing students with valuable guidance and inspiration as they prepare to enter the workforce. We look forward to continuing this impactful series.

Special Projects For Improving The Classroom Experience (SPICE)

Dr. Fallah-Fini's proposal was awarded for **"Enhancing Systems Engineering: Integrating Model-Based Systems Engineering Framework and Project-Based Learning for Industry Alignment."** This project aims to modernize the course by embedding Model-Based Systems Engineering (MBSE) principles and hands-on projects that mirror real-world industry challenges. This enhancement will equip students with practical systems thinking skills and prepare them for the evolving demands of today's engineering workforce.

Dr. Mirzaei's proposal **"Enhancing the IME Department's Foundry and Welding Labs with a High-Temperature Furnace and Multipurpose Welding Machines"** focuses on upgrading core lab facilities to better support hands-on learning and advanced manufacturing research. These enhancements will expand student access to industry-relevant processes, foster experiential learning, and strengthen the department's capabilities in casting, welding, and materials engineering.

## Shining Bright: A Beacon and an Advocate

Dr. Moe Rabea (Left photo) has been recognized for his commitment to academic excellence and teaching and he continues to inspire both students and colleagues. He received the **Beacon of Knowledge** award at the College of Engineering. Dr. Rabea's expertise lies in manufacturing engineering, where he is known for delivering engaging lectures and providing valuable industry insights to students. Dr. Rabea is highly regarded for his dedication to student success and his ability to make complex concepts accessible.

Andy Gustilo (Right photo) has been recognized for support and advocacy for students since he has made a meaningful difference in the educational experience of many. He has received the **Student Advocate** award at the College of Engineering. Andy is the heart and soul of our department's tech and laboratory support. Known for his kindness and engaging approach, Andy works closely with faculty and students to ensure they receive timely assistance with their laboratory needs. We are truly fortunate to have Andy's unwavering support and expertise in our community.

Legacy in Action: Dr. Phil Rosenkrantz
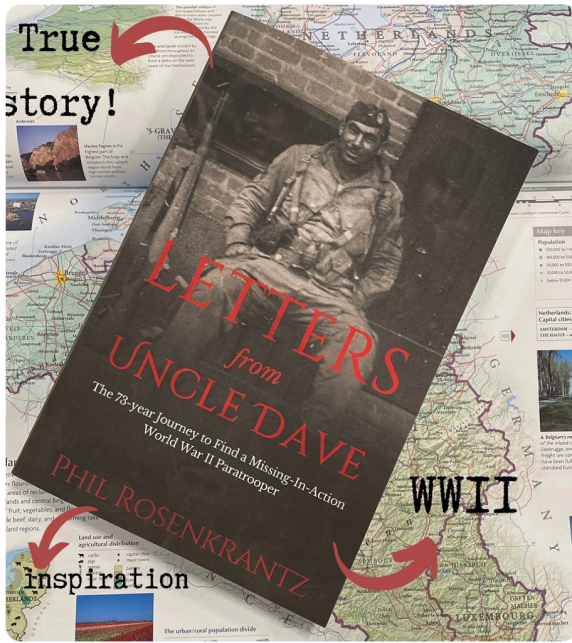
Although retired from full-time teaching, **Dr. Phil Rosenkrantz** continues to embody the spirit of curiosity and service that defined his years in the IME Department. Most recently, he presented research at the **American Society for Quality (ASQ) Lean Six Sigma Conference**, reflecting his ongoing commitment to academic and professional excellence. Beyond the classroom, Phil turned to storytelling, publishing *Letters from Uncle Dave*, a compelling account of his uncle's WWII disappearance that has touched audiences across the U.S. and the Netherlands. When not teaching or speaking, you might find him **hiking in the San Bernardino Mountains**, where he volunteers with the San Gorgonio Wilderness Association—sharing his love for nature and John Muir with fellow hikers. Whether in front of a class, behind a book, or on a mountaintop, Dr. Rosenkrantz continues to inspire with his energy, heart, and dedication to lifelong learning.

Future Engineers, Real-World Impact

First Place at IISE Western Regional Conference

Four Industrial and Manufacturing Engineering students — Kevin Szeto, Zachary Meas, Christopher Rubio, and Alonzo Armendarez — won first place at the 2025 IISE Western Regional Conference for their TDK-Lambda-sponsored project aimed at reducing RMA repair lead time for a medical power supply unit. Guided by Dr. Ellips Masehian and Dr. Kamran Abedini, they applied lean practices and built a MATLAB-based Expert System to support repairs, achieving a 40% lead time reduction and a projected $329,660 benefit. They also presented at the College of Engineering Symposium and will represent Cal Poly Pomona at the 2025 IISE Annual Conference in Atlanta.

A Guiding Light for Student Success

We are proud to share that Dr. Shokoufeh Mirzaei has been selected as the 2024-2025 **Outstanding Advising Partner** at Cal Poly Pomona. This prestigious award recognizes her dedication to student success and unwavering support for academic advising initiatives.

End of Year Banquet

The IME Department wrapped up the academic year with a lively End-of-Year Banquet, attended by more than 80 students, faculty, and Industry Representatives. The event featured dinner, awards, entertainment, and club officer transition and appreciation, creating a memorable evening of connection. It was a wonderful opportunity to recognize student achievements, honor outgoing leaders, and welcome new ones as we look ahead to another impactful year. A group photo captured the strong sense of community that defines the programs at the IME department.

Faculty Publications

- Fallah-Fini, S., Lemke, M., Brown, K., et. al., 2024, "**A Group Model Building Process to Address the Rise in Cardiovascular Severe Maternal Morbidity Among Black Women in North Texas**". Proceedings of the 2024 System Dynamics Conference. August 4-8, Bergen, Norway.
- Lemke, M., Brown, K., Fallah-Fini, S., et. al., 2025, "**Understanding and Addressing

Severe Maternal Morbidity Among Black Women in Texas: Findings from a System Dynamics Group Model Building Study", under review, Journal of Racial and Ethnic Health Disparities.

- Lemke, M., Brown, K., Fallah-Fini, S., et. al., 2025, "**One Month, Two Projects, Many Lessons: Insights from Concurrent System Dynamics Group Model Building Approaches**", under review, System Dynamics Review Journal

- Najafi, A., Mirzaei, S.: RMCDA: **The comprehensive R library for applying Multi-Criteria Decision Analysis methods**. Software Impacts. 24, 100762 (2025)

- Mirzaei, S., Arzate, J., Vijay, Y.: **Enhancing Aviation Communication Transcription: Fine-Tuning Distil-Whisper with LoRA** (2025) (Pre-Print)

- Mirzaei, S., Garcia, A.M.: **A Framework to Define Optimal Fallowing Programs: a Case Study of California Water System** (2025) (Pre-Print)

- Y. Zhou, D. Jiang, A. Al-Akailah, F. Ning, 2024. **Understanding the formation of laser-induced melt pools with both wire and powder feeding in directed energy deposition**. Additive Manufacturing, 89, p.104312.

- D. Jiang and F. Ning, 2024. **Material extrusion additive manufacturing of bi-metal structures: A numerical and experimental study of interfacial microstructure**. Manufacturing Letters, 41, pp.965-971.

- D. Jiang, Y. Zhou, M. Poliks, P. Borgesen, F. Ning, 2025. **Mechanistic understanding of microstructure evolution in extrusion-based additive manufacturing of stainless steel using modeling, simulation, and experimental analysis**, 2024. Journal of Manufacturing Processes, 137, pp. 68-81.

- Y. Liu, D. Jiang, F. Ning, 2025. **Sintering mechanisms in metal extrusion-based sintering-assisted additive manufacturing: State-of-the-art and perspectives**, Journal of Manufacturing Science and Engineering, 147(7), p. 070801.

- Somayé Ghandi and Ellips Masehian, "**An efficient solution to the simple assembly line balancing problem type 1 using iterated local search**," *Engineering Applications of Artificial Intelligence*, Volume 144, 2025, No. 110162

Our Mission: Prepare students for industry and advanced studies by

implementing an inclusive polytechnic philosophy through collaborative teamwork, innovation, entrepreneurship and professional integrity.

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