



AUBURN
ENGINEERING

INDUSTRIAL AND SYSTEMS ENGINEERING NEWSLETTER

Fall 2024



Welcome to the Fall 2024 Auburn University Industrial & Systems Engineering (AU ISE) Department newsletter. The AU ISE department is excited to embark on another academic year filled with new opportunities and continued growth. Since our most recent Spring newsletter, we've seen remarkable achievements throughout the department. Some general statistics on our student body include a total of 479 ISE undergraduates, a freshman class of 116, and 219 graduate students consisting of 79 Ph.D. students and 140 master's students. We have awarded more than \$160,000 in department scholarships, and three new department scholarships have been established by and in honor of AU ISE alumni.

Over the summer, we hosted our first summer camp to prepare the next generation for careers in advanced manufacturing, which was funded by the National Science Foundation. In collaboration with professors from the College of Education, ISE Assistant Professor Peter Liu designed the camp, which focused on integrating artificial intelligence and additive manufacturing into STEM education. The week-long event welcomed 33 high school students and 10 high school teachers, offering them hands-on experience and a unique opportunity to explore the future of smart manufacturing.

We concluded the summer by celebrating with two of our outstanding faculty members. Tom Devall, director of automotive manufacturing initiatives, and Dan O'Leary, ISE lecturer, who earned their doctoral degrees, joining eight additional ISE doctoral graduates.

As we do each Fall, the ISE department gathered ahead of the start of the semester to develop our strategic plan. This meeting typically includes collaboration with other universities, allowing us to benchmark performance, share best practices, and generate innovative ideas for continuous improvement. This year, we held our planning session in Pensacola, Florida, where we also convened a systems engineering summit with the University of South Alabama. These sessions help lay the foundation for the department's actions and future success, ensuring our efforts are purposeful, focused, and aligned with Auburn's broader goals.

We are also pleased to welcome two new faculty members to the team. Dr. Missie Smith joins the Center for Occupational Safety, Ergonomics, and Injury Prevention as an assistant professor, bringing her expertise in human factors and technology interaction. Dr. Christian Zamiela has joined us as an assistant research professor with a background in AI-enabled quality assurance in additive manufacturing. He will be a key contributor to expanding the department's model-based systems engineering initiatives.

Auburn University's Samuel Ginn College of Engineering continues to be recognized as a leader in higher education. We ranked among the nation's top public institutions in U.S. News and

World Report, coming in at No. 31 in the 2024 Best Graduate Schools, with our ISE program itself ranked at No. 23. The Samuel Ginn College of Engineering also earned a ranking of No. 30 in the 2025 Best Undergraduate Engineering Programs.

As we kick off this new academic year, we remain committed to excellence in education, research, and outreach. We look forward to sharing more milestones and success stories with you as we continue to shape the future of Auburn industrial and systems engineering. Thank you for your ongoing support.

War Eagle!

Greg Harris

Professor & Chair, Industrial and Systems Engineering

Joe W. Forehand/Accenture Distinguished Professor



Professors receive \$400K NSF grant for Lean Manufacturing education

Three Auburn University professors have been awarded a nearly \$400K grant from the National Science

Foundation (NSF) to enhance Lean Manufacturing education.

Over the next three years, Tom Devall, lab director, Jorge Valenzuela, Philpott-WestPoint Stevens Professor of Industrial and Systems Engineering and Chih-hsuan Wang, professor in the Department of Educational Foundations, Leadership and Technology, will lead this project. The goal of the project is to expand access to experiential training beyond campus to the Tiger Motors Lab, often referred to as the Lego Lab. The lab provides students with hands-on experience in a 4,000-square-foot integrated manufacturing facility, which simulates high-volume automotive manufacturing environments like those used by Toyota and Honda.

“We know we’ve got something special in that lab,” Devall said. “I have conducted research that shows the lab’s impact on students helps them perform better. It’s more effective than classroom lectures alone, so we wanted to make this experience available to distance learners.”

Currently, online students observe lab production runs but cannot actively participate. The NSF project aims to change that by developing immersive 360-degree video modules that allow students to walk through the lab virtually and complete assignments based on real data collection.



awarded
Fulbright
Scholarship to
collaborate in
Turkey.

Aleksandr Vinel, associate professor of industrial and systems engineering at Auburn University, has been awarded a prestigious Fulbright U.S. Scholar Program grant. Vinel will spend the Spring 2025 semester teaching and collaborating at Bilkent University in Turkey.

Fulbright U.S. Scholars are esteemed faculty, researchers, administrators, and professionals who engage in teaching and research at institutions around the globe. These scholars often participate in cutting-edge research, expand their professional networks, and establish international collaborations that benefit their home institutions.

Vinel's interest in Turkey as a destination for his upcoming sabbatical was sparked by a previous visit as a tourist. He was impressed by the country's strides in technological innovation, its strong engineering programs, and the rich cultural diversity.

"Turkey's engineering education follows a similar approach to that of the U.S., with many programs accredited by ABET," Vinel said. "This common foundation presents ample opportunities for collaboration in unique settings, with fewer barriers to entry."



ISE instructor
wins
Outstanding
Faculty Award

Dan O'Leary, an instructor for the Department of Industrial and Systems Engineering (ISE), was recently recognized with the

Samuel Ginn College of Engineering's Outstanding Faculty Award.

Nominated by the student chapter of the Institute of Industrial and Systems Engineers (IISE), recent ISE graduate Matthew Harmon said O'Leary was repeatedly suggested as a nominee by IISE members.

"He is always trying to improve himself as a professor and genuinely wants students to succeed," Harmon said.

From jokes to sports and old movies, O'Leary's lectures keep class interesting and educational.

“Dan does a phenomenal job of making his lectures very engaging, often by starting class with the latest news on generative AI while simultaneously discussing Auburn basketball,” Harmon said.

Harmon also praised O’Leary’s dedication to students.

“He keeps a promise of lifelong learning,” Harmon said. “He will continue to answer questions and help you even after you have passed his class.”



Bird Inc. is back with a \$1.7M DOD grant for two years

The manufacturing industry is projected to have two million vacancies by 2025. John Cranston and the Interdisciplinary Center for Advanced Manufacturing Systems (ICAMS) want to change that statistic.

Armed with a \$1.7 million project from the U.S. Department of Defense (DOD) to revive the Bird Inc. program created by Cranston in 1996 to widen students’ worldviews to possible manufacturing jobs available after finishing high school, ICAMS looks to visit more than 28,000 sixth-grade students in Alabama throughout the next two years.

Bird Inc. is a 50-minute activity that simulates a manufacturing environment. Students participate in a classroom business. The class includes a company president, sales and marketing professional, engineer, tool and die machinist, technician and quality control specialist. The rest of the class are potential investors.

“We teach them important business concepts they can use in their lives such as profit and loss, marketing and manufacturing real products,” Cranston said.



Engineering doctoral students gain international experience in Norway

Two doctoral students in the Department of Industrial and Systems Engineering recently studied abroad in Norway for a semester.

Juan Morande and Daniela Granados-Rivera were part of an academic exchange program with the Norwegian University of Science and Technology (NTNU) under the FutureLog project, which explores logistics 4.0 applications globally.

Morande's research focuses on truck-loading logistics within distribution networks.

"In Norway, I worked with another doctoral student on the topic of closed-loop sustainable supply chains," he said. "We modeled supply chains, where the collection of used products and the recycling of them were taken into account when designing the supply chain and the product itself."

Morande added that working in Norway helped him learn different techniques to take back to his doctoral research.

Granados's research involves using mobile factories and drones to supply spare parts to offshore platforms, in partnership with NTNU and Fieldmade, a Norwegian company specializing in mobile factories with additive manufacturing technology.

"Going there was an opportunity to work closely with them and visit Fieldmade to learn more about their operation," she said.



Alumnus credits ISE faculty for Army career success

Industrial and Systems
Engineering (ISE) alumnus
Brandon Daugherty credits

the ISE faculty for preparing him for his career as the director of safety for the U.S. Army Aviation and Missile Command (AMCOM).

Daugherty earned a Bachelor of Science in Industrial and Systems Engineering from Auburn University in 2007 and a master's in 2011. He also earned a graduate certificate in occupational safety and ergonomics in 2011.

As the director of safety, Daugherty oversees four safety divisions; Air Defense, Aviation, Operations, and Tactical Missiles. He manages a workforce of more than 80 employees consisting primarily of safety engineers, occupational safety and health managers and aviation maintenance specialists. Daugherty also advises AMCOM leadership on safety and maintenance matters impacting U.S. Army Aviation and Missile systems to optimize joint Warfighter capabilities at the point of need.

Daugherty has almost 14 years of safety engineering and risk management experience across

the private and public sectors supporting Army aviation weapon systems. Before his current role, Daugherty served in various roles within the Aviation Systems Safety Division at the AMCOM Safety Office, including aviation system safety division chief, manned aircraft team lead, safety of flight team lead and system safety engineer.

Daugherty said engineering always intrigued him as a kid.

“I enjoyed learning about all things that moved,” he said. “I didn’t care as much about the finer things of a jet engine as much as I cared about how the jet engine works with the entire aircraft. The design of the entire aircraft from nose to tail intrigued me the most and that macro-level thinking best aligned with ISE when I researched the various engineering disciplines.”



Six ISE doctoral students awarded ASSP Foundation Scholarships

Since 1990, the American Society of Safety Professionals (ASSP) Foundation has awarded more than \$6 million in academic scholarships and

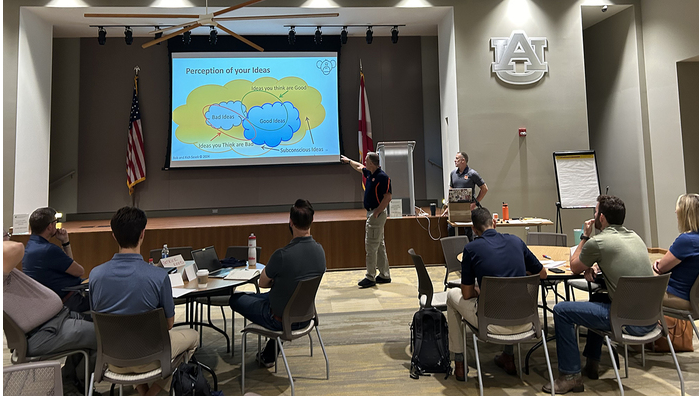
professional education grants to occupational safety and health students and professionals working toward their educational goals. This year, six doctoral students in the Auburn University Department of Industrial and Systems Engineering (ISE) have been awarded these scholarships, totaling \$32,000.

Doctoral student Suhas Sudhir Bharadwaj has been awarded the ASSP Foundation Scholarship, funded by Amazon.

“When I learned that I had received an ASSP scholarship, I was overjoyed and incredibly grateful,” Bharadwaj said. “Apart from lifting a huge weight off my shoulders, it has renewed my sense of confidence in my abilities and has made me excited for the future. It’s a moment I’ll never forget.”

Bharadwaj said the scholarship will allow more time to dedicate to research while staying on track for a timely graduation.

“By fully focusing on my dissertation, I hope to make a meaningful academic contribution that also promotes safer workplaces,” he said. “Overall, it enhances my learning experience and helps me reach my academic goals.”



Huntsville
workshops
inspire
innovation,
problem-solving

The Auburn University Department of Industrial and Systems Engineering (ISE) recently held two unique workshops at the Auburn University Research and Innovation Campus in Huntsville. The workshops focused on problem-solving, innovation and cognitive engineering.

The Huntsville workshops included hands-on activities. The “Introduction to Cognitive Engineering and System Design” short course and workshop, hosted July 12, was led by Richard Garnett, a senior lecturer, and Richard Sesek, the Tim Cook Professor.

Successful systems integrate people and machines to achieve optimal performance. Cognitive engineering focuses on how well a system aligns with the cognitive capabilities of its users. It leverages an understanding of human perception, mental processing, and memory to enhance technology design and usability.

Sarah Moore, ISE alumna and a systems engineer supporting the International Space Station, participated in the workshop. Moore, who studied under Sesek and Garnett, was enthusiastic about the opportunity to gain more knowledge from them.

“The experience of the workshop was wonderful,” she said. “It was very intimate and personalized. I loved how much of a discussion it was rather than a simple lecture. I learned new ways to center design around humans and refresh old ones.”



ISE senior finds
success in
summer
internship with
PepsiCo

Hannah Patterson, a senior in Auburn University’s Department of Industrial and Systems Engineering (ISE), spent her summer interning at PepsiCo Beverages in Stone Mountain, Georgia, where she made a significant impact as a supply chain intern.

“The knowledge I gained this summer was so valuable,” Patterson said. “I was given the chance to perform a Rinse Water Optimization experiment to improve the changeover process in the syrup tanks, which saved the site nearly \$50,000 annually in water, chemical and labor costs.”

The project allowed Patterson to establish a flavor-to-flavor changeover matrix and collaborate with operators, line leads and quality control members to achieve the goals. She credits the hands-on experience for helping her grow professionally and personally.

Originally from Mobile, Patterson will pursue her master's degree through Auburn's Accelerated Bachelor's to Master's program. Her career aspirations include a manufacturing-focused career.

"My internship solidified my passion for manufacturing, and I'm especially interested in pursuing opportunities within the food and beverage industry," she said. "However, I'm also curious about automobile and large-scale manufacturing, such as plane and ship production."



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