The MechSE department has a rich history of influencing the world through fundamental contributions in engineering mechanics and mechanical engineering. And in MechSE today, more and more talented women are fueling the field with a wide array of research and innovations that impact society in a variety of ways. Get inspired by just a few of the extraordinary achievements of our women students, faculty, and alumni.

Welcome to MechSE!

In the last six years, the Department of Mechanical Science and Engineering (MechSE) at the University of Illinois has seen a remarkable 68% increase in enrollment for women undergraduate students.

And women make up 30% of our current freshman class, putting us ahead of the national curve for mechanical engineering departments.

MechSE’s undergraduates in engineering mechanics and mechanical engineering are an impressive group, and the young women among them play a vital role in making the department a top program. Through academic excellence, leadership roles in student organizations, unique internships, creative outreach, and much more, they continually achieve greatness. And we help our engineers build real-world skills beyond the classroom. College of Engineering students are highly employable, receiving an average 2+ job offers upon graduation.

Nine new women professors have joined MechSE in the last five years, and their inspiring talent has helped solidify the department as a home for greatness. Mechanical science and engineering offers so many opportunities for life-changing innovations in health and biology, energy, the environment, national defense, manufacturing, and transportation. Our women faculty are well-represented across all of these areas and many more.

Procurement of nuclear fuel. Disney World ride design. Teaching the next generation of Navy and Marine Corps officers. Software design for semi-autonomous vehicles. To be a MechSE alumna means having a career that’s way beyond the “expected,” whether they are ascending the ranks in industry, contributing to future generations with a career in academia, or blazing a new trail through entrepreneurship.

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Leading the Way

MechSE has emerged as a top program for women in engineering

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Get inspired by just a few of the extraordinary achievements of our women students, faculty, and alumni.
I think my varied passions — flying planes, creative writing, music, and many others — represent the diverse interests of MechSE’s undergrads.

Taylor Tucker, senior in engineering mechanics and a MechSE blogger, spent a summer assisting an aircraft mechanic in a full-service hangar at Oakland Memorial Airport in Houghton Lake, Michigan. Her work involved helping with annual inspections — cleaning or replacing spark plugs, changing oil, and checking the condition of the engine mount, gaskets, and seals. Tucker is also conducting research on particle collisions in a Mars atmosphere, and she is ambitiously working toward her private pilot’s license.

A new organization recently launched to support the growing number of women undergraduate students. Women in MechSE was created for and by MechSE women to share experiences and learn about career opportunities. The group originally began as a committee under ASME, co-directed by undergrads Kea Evans and Sandra Gonzalez. They believed that leadership among women in MechSE had decreased, so they wanted to create a group to encourage it. Through career fairs, leadership events, company visits, lunches with women faculty, and weekly meetings, the group provides opportunities to explore career paths and encourages women to join other MechSE registered student organizations that have been predominantly male in the past.

"I think my varied passions — flying planes, creative writing, music, and many others — represent the diverse interests of MechSE’s undergrads." — Taylor Tucker

"Being part of a community of bright and talented students pushes me to continue to be the best that I can be." — Taylor Tucker

The resume of senior Oluwami Dosunmu-Ogunbi reads like an accomplished career woman. She has conducted research on powder-based 3D food printing at the National University of Singapore. As a student minor in the highly competitive Hoeft Technology and Management Program for engineering and business students, she participated in an international business competition in Brazil over winter break. She interned at the Toyota Motor Manufacturing plant, taking on two major projects and seven others to improve the testing process of quality checks. She is a Chancellor’s Scholar, and helps influence engineering education — serving as a Student Consultant on Teaching (SCOTT); a Resident Project Advisor and mentor to 50 incoming engineering students; and a Lead ELA (Engineering Learning Assistant) for freshmen. Her research experience in the lab of a pioneering virtual reality scientist at Illinois confirmed her interest in biomechatronics.

"As one of the largest and best Colleges of Engineering in the world, we have a duty to increase the diversity of engineering and science. The future success of our college and of the solutions that our engineers build both depend on creating vibrant teams of individuals from different personal, cultural, and disciplinary perspectives." — Andreas Cangellaris, Dean of the College of Engineering

"I want to help improve the functionality and cost of assistive and prosthetic devices." — Liz Livingston

When engineering mechanics senior Liz Livingston isn’t competing as a pole vaulter for the Illinois Track and Field team or assisting with research in the Tissue Biomechanics Lab in MechSE, she’s leading the Society for Experimental Mechanics. As past president of SEM, she has helped the club double in size through increased awareness and worked with department staff to improve the EM curriculum. This fall, she joined a select few as an Engineering Learning Assistant for a freshmen orientation class. And although her current commitments keep her too busy to actively volunteer, Livingston helped run a non-profit organization for eight years in Dallas, Texas, repairing and distributing bicycles throughout the city. After graduation, she hopes to work in the biotechnology arena or pursue a graduate degree in biomechanics.

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"It’s important to me to support equal opportunities for minorities in engineering."

Brittany Miriki has held several executive roles in the university’s chapter of the National Society of Black Engineers (NSBE). From this experience, she recognized a need to unify black women in STEM—and co-founded Sistas in STEM, a new organization aimed at creating a support system. Thanks to networking for her public relations position in NSBE, Miriki gained an interest in technical sales, and since graduating, she has been employed in the Sales Development Program for Ingersoll Rand in the industrial supplier’s Chicago office.

The University of Illinois is ranked third in the country for educating the most women engineers. The university is dedicated to ensuring that women are well represented at the undergraduate level—thanks in part to a major increase in financial support for our students.

In fall 2016, of the 510 incoming freshmen who were offered scholarships from the College of Engineering, nearly half were women.

But scholarships play just one part in advancing the vital role of women in engineering. A consistently supportive environment, along with progressive and forward-thinking opportunities, are also an important part of the experience.

"Mechanical science and engineering offers so many opportunities for life-changing innovations in health and biology, energy, the environment, national defense, manufacturing, transportation, and more. Engaging and elevating the perspective of women in this field makes MechSE that much more likely to be the place where those innovations happen," said Tony Jacobi, MechSE department head.
Women of MechSE

Alison Dunn, assistant professor
In her Materials Tribology Laboratory, Dunn’s research centers on what she calls “non-traditional tribology,” and she is most interested in natural biological gizmos—specifically any part of the body that has a sliding interface, like knees, hips, and eyes—and therefore has the potential for disease associated with damage. Reducing friction, particularly of an implanted material, could extend the life of implants and cause less damage or rejection. 

Elizabeth Atia-Woessner, professor, Willett Scholar, Associate Head of Undergraduate Programs
Using clinical-level medical images and finite element analysis in her TiCasa Biomaterials Lab, Karish examines the structural and mechanical properties of musculoskeletal tissues to better discern and develop treatments for bone and joint diseases. With a new grant to study the long-term effects of subchondroplasty procedures on bone and cartilage strength, she hopes to understand where the problems of osteoarthritis begin and to present treatments for subchondral bone defects.

Amy Wagoner Johnson, associate professor
To address complications in the repair of diseased or traumatized bone, Wagoner Johnson designs synthetic bone substitute materials and scaffold systems that may one day replace bone grafts currently harvested from patients or donors. Working with local surgeons, her team studies the scaffolds’ macro- and micro-structure to interact on a more personal level, as well as robots for the elderly, allowing this growing population to live independently for longer and improve their quality of life.

Xiaofei Wang, research assistant professor
Wang’s primary interests are the experimental aspect of energy conservation in air conditioners and refrigeration systems—aiming for sustainability and new, renewable energy. She explores the flow regimes of two-phase flow in air-conditioning and refrigeration systems— which affect heat transfer. Her goal is to reduce energy consumption from these systems in residential and commercial systems.

Amy Wissa, assistant professor
Inspired by the agility, adaptability, and efficiency of bird wings, Wissa designs and builds adaptive structures that change their shape in response to external stimuli. In her Bio-inspired Adapted Morphology (BAM) Lab, her current research aims to revolutionize unmanned aerial vehicle design and has both military and civilian applications– including surveillance for combat intelligence and inspection of crops.

FACULTY
"In my work I aim to improve the daily comfort of machine operators and prolong the life of Caterpillar’s machines so they can work longer between maintenance stops."

Gail Butler (BSME ‘75), the sole female team captain in SAE Baja’s recent history, credits her role on the team as a major influence in shaping her career path and enabling her to put into practice all of the concepts she learned in the classroom. After a student practicum at Caterpillar, Butler has been employed since 2015 at the company’s Peoria, Illinois, facility as a test engineer in the motorgrade transmission development group, assisting with both lab and on-machine testing. Part of her job is to tune shifts to minimize wear in the transmission while also reducing the jerking motion the operator feels during gear changes.

"I’m hoping to impact the future leaders of America and help motivate and mentor the next generation of Navy and Marine Corps officers."

Captain Serena Tyson (MSME ‘08) graduated from the United States Naval Academy, earning a place in the top ten percent of her class and a distinction as the top female graduate in the Weapons and Systems Engineering Department. As a master’s student in MechSE, she conducted research and co-authored papers on a pneumatically operated ankle-foot orthosis—a small orthotic device that uses fluid power to return flexibility of motion to people who have lost muscle control over their lower leg. She then trained at Varse Air Force Base, earning her Naval Aviator Wings in 2010. Subsequent assignments saw her on helicopter squadrons; deployed to Afghanistan to fly combat missions; as an Attack Helicopter Commander and Functional Check Pilot; and currently as an Equal Opportunity Officer and Quality Assurance Officer for her Marine Light Attack Helicopter Squadron 169, and as instructor in the Naval Academy’s Aerospace Engineering department.

"One thing that was surprising to me was the wide reach of the University of Illinois when I went to Silicon Valley. Illinois is a very respected name and that was always comforting to know that I was an alumnus of such a great university."

After earning her degrees from Illinois, Melonee Wise (BSME ‘04, MSME ‘06) worked as manager of robot development at the widely revered startup Willow Garage. Regarded as one of the world’s best roboticists, she has been CEO of Fetch Robotics since 2014, and that year she was named to “The 15 Most Important People Working in Robotics” list by Business Insider. With a huge facility in San Jose and about 35 employees, the company has raised millions in startup capital and currently has two state-of-the-art robots—Fetch and Freight—to support customers in commercial industries by automating warehouse processes and making humans’ jobs more efficient.

"The University of Illinois gave me a transformative start to my career. As a result of that transformation, I now have the privilege and responsibility to help transform the lives of our women engineering students here at Penn State."

Professor Karen Thole (BSME ‘82, MSME ‘84) runs the Steady Thermal Aero Research Turbine Lab at Penn State University, where she is Head of the Department of Mechanical and Nuclear Engineering. Her lab is a state-of-the-art gas turbine engine test facility with continuous operation at realistic engine conditions, and her research group focuses on determining innovative ways to cool high components of those engines. Karen also works tirelessly to empower young women in engineering to inspire high school girls to pursue a career in engineering. She has won numerous awards for her teaching, mentoring, and research, and in 2011 was honored by the White House as a Champion of Change.

"I’m developing new attributes to Ford’s existing semi-autonomous vehicles, helping people drive better and safer."

Semi-autonomous vehicles are one of the newest ways auto companies are developing technologies to better assist drivers. As a research engineer at Ford Motor Company, Nanjun Liu (MSME ‘11, PhD ME ‘14) works on sensors and software for semi-autonomous features that will perform like a co-pilot, acting as an additional set of eyes, ears, hands, and legs.

"In my work I aim to improve the daily comfort of machine operators and prolong the life of Caterpillar’s machines so they can work longer between maintenance stops."

Growing up in Miami, Walt Disney World was Natalie Reyes’ (BSME ‘15) favorite place to visit as a child. It is the happiest place on Earth, after all. She also discovered an interest in mechanical engineering early on—and found the perfect way to combine these two passions. Thanks in part to several engineering internships at Disney World during her undergraduate career, Reyes is now employed as a R&D Mechanical Engineer with the Design and Engineering team, where she works on a variety of machine design and analysis projects.

"I help improve the functionality and reliability of the rides at Walt Disney World."

"I now have the privilege and responsibility to help transform the lives of our women engineering students here at Penn State."

"I’m helping to improve the functionality and reliability of the rides at Walt Disney World."

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"The 11 reactors we operate in Illinois generate 48 percent of the state’s electric power supply and 90 percent of its carbon-free power, which prevents the release of nearly 80 million metric tons of carbon dioxide annually—the equivalent of taking more than 15 million cars off the road."

As Director of Nuclear Fuel Supply for Exelon Generation, which operates the largest nuclear fleet in the country, Jeanne (Tortorelli) Shobert (BSME ’85) procures nuclear fuel for the reactors that Exelon owns and operates in Illinois, Maryland, New York, New Jersey, and Pennsylvania. Managing a team of five, she is responsible for purchasing uranium ore, along with various ore-processing services, from sites around the world. “In the final step of the process, uranium is made into ceramic fuel pellets, which are loaded in fuel assemblies that go in the reactor core. My team works closely with the reactor core design group and the fuel vendor to ensure safe, efficient operation of the fuel once it’s in the reactor,” said Shobert, who also earned an MBA from the University of Illinois at Chicago in 1991.

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