





# INNOVATION

The UW was named the number one most innovative public university in the U.S. by Reuters in 2018. Ranked 3rd at the UW in terms of faculty and student startup companies, ME is a leading department on campus for innovation, commercialization and industry collaboration.

## MARKET IMPACT

Since 2012, the department has been responsible for:

-  **366** PATENTS FILED
-  **28** INSTANCES OF TECHNOLOGY LICENSED BY EXTERNAL COMPANIES
-  **14%** OF ALL STARTUPS AT UW
-  **25** UW COMOTION INNOVATION FUND AWARDS

*\*According to CoMotion*

## INDUSTRY CONNECTIONS

Partnerships between industry and ME push the boundaries of research and innovation and help create extraordinary future generations of mechanical engineers. Industry partners engage with ME in many ways, including:

- Collaborating on research projects
- Supporting students via scholarships and fellowships
- Sponsoring student capstone projects and teams
- Recruiting students for internships and full-time jobs
- Sponsoring grants or collaborating with faculty on grant applications
- Presenting lectures and seminars

### Notable industry partners include:

- |                      |                 |
|----------------------|-----------------|
| • The Boeing Company | • Nabtesco      |
| • PACCAR             | • Origincell    |
| • Amazon             | • RICOH         |
| • General Motors     | • Safran        |
| • Janicki Industries | • ElectroImpact |

*"The potential to create technology that will lead to a cleaner environment, improved health and a better standard of living for all is what makes mechanical engineering such a fascinating and rewarding profession."*

**Per Reinhall**, Professor and Chair, UW Mechanical Engineering



Every day, the future is developed in our labs. From the development of devices for the early detection and treatment of cancer to the development of alternative energy using nanotechnology, the faculty and students of the Department of Mechanical Engineering are doing their part to create a healthier, cleaner and more prosperous world.

## OUR MISSION

### LAUNCHING CAREERS

Educating tomorrow's leaders is our highest priority. We draw talented and creative students and offer a world-class education with an incredible breadth of skill and technological training. Our graduates are well equipped to succeed and to move through their careers as life-long learners. They are making a difference in diverse sectors such as biotechnology, health, environmental engineering, energy, transportation, manufacturing and information systems.

### CROSSING BOUNDARIES

Our students and faculty work in interdisciplinary, collaborative environments, forging partnerships across campus and with government agencies and industry. Our research has increasingly expanded in the areas of health technology, energy and advanced manufacturing. This focus has allowed us to diversify our curriculum and move the department to the next level in national and international stature.

Through the Engineering Innovation in Health program, students work alongside engineering faculty and medical professionals to develop cost-effective solutions to today's pressing clinical challenges. The projects and deliverables are managed within a year-long design course sequence: fall quarter is dedicated to deepening an understanding of the clinical need and device design, and winter and spring quarters focus on prototyping and evaluation. We are preparing the next generation of students and faculty in medical device development and innovation while establishing an interdisciplinary culture of engineers and health practitioners.

The department also has focused research programs in areas such as novel and automated manufacturing, clean and alternative energy, micro and nanotechnology, biomechanics, robotics, machine learning, and advanced manufacturing and materials.

### THE POWER OF INVENTION

Mechanical Engineering is a leading department at the University of Washington for patents and innovations. Bringing research to market through startup companies and licensing agreements benefits the state economy. Our research and expertise leads to revolutionary innovations that help address key societal challenges and improve lives.



# DEGREE PROGRAMS

**Bachelor of Science (BSME)** – prepares students for diverse careers in engineering, industry or graduate work

**Master of Science in Mechanical Engineering (MSME)** prepares students for careers in research or industry, or further graduate study

**Master of Science in Engineering (MSE)** – an interdisciplinary program for those whose research crosses traditional areas of study

**Doctor of Philosophy (PhD)** – intensive research prepares students for advanced-level professional careers in academia and industry

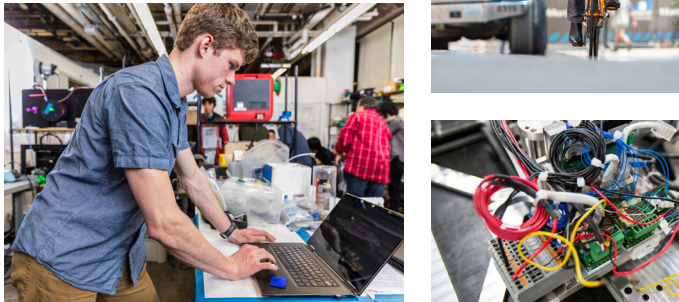
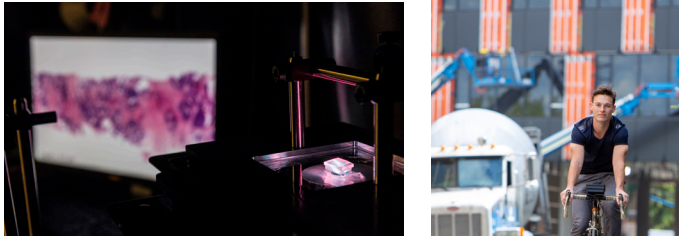
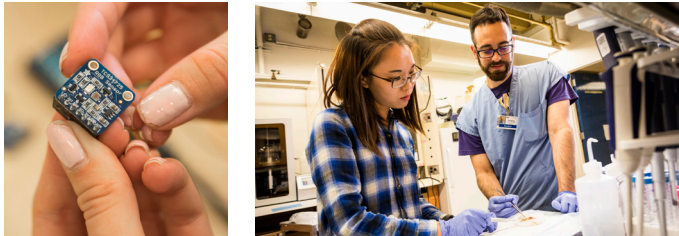
## FACULTY

### COMPOSITION

- 36 tenured, tenure-track and research faculty
- 24 joint or adjunct faculty from other UW engineering, medicine and science departments
- 58 affiliate faculty representing industry and external research and educational institutions
- 11 postdoctoral research associates

### ACHIEVEMENTS

- 10 National Science Foundation Presidential, Young Investigator and Early Career Award recipients
- 3 National Academy of Engineering members
- 5 Washington State Academy of Sciences members
- 3 UW Presidential Entrepreneurial Faculty Fellows



## STUDENT DEMOGRAPHICS

### For academic year 2017-2018:

Undergraduates enrolled: 408 | BSME degrees awarded: 142  
Graduates enrolled: 367 | MSME/MSE degrees awarded: 102  
Doctoral degrees awarded: 16

## UNDERGRADUATE EDUCATION

### PROGRAM FEATURES

- Fundamental coursework in mass and energy balances, fluid and solid mechanics, heat and mass transfer, dynamics and vibrations, mechatronics and robotics, biomechanics, acoustics, materials, design, controls and manufacturing.
- All students participate in laboratory courses and research or design projects.
- Teamwork, communication and problem-solving skills development, systems analysis, process and product design, prototyping and interdisciplinary projects.
- Concentrations available in mechatronics, nanoscience and molecular engineering, biomechanics, energy, and engineering innovation in health.

### EXCELLENCE

- 65 scholarships awarded by the department
- 3.67: Average cumulative GPA of incoming undergraduates
- 4 years: Average time to receive the BSME degree

## GRADUATE EDUCATION

### PROGRAM FEATURES

- Concentrations available in environmentally sensitive energy conversion, health systems and biotechnology, mechatronics, and advanced materials, structures and manufacturing.
- Fundamental and translational research opportunities for leading-edge, interdisciplinary work.
- Research and teaching assistantships and fellowship opportunities available to graduate students at all levels.
- Online professional and continuing education options available to integrate coursework with professional work.

### EXCELLENCE

- 8 National Science Foundation Fellows
- 4 College of Engineering Dean's Fellows
- 2 Graduate Diversity Fellowship

## CLUBS AND COMPETITIONS

ME students participate in award-winning student-led teams and communities, including:

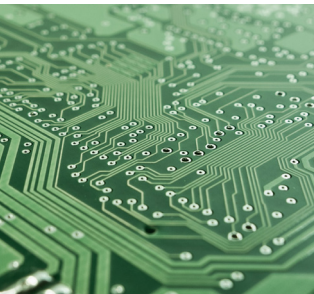
- EcoCAR
- Engineering Innovation in Health
- HuskyADAPT
- UW Hyperloop
- Human Powered Submarine
- Husky Robotics
- UW Formula Motorsports
- WOOF 3-D Print Club

# RESEARCH IMPACT

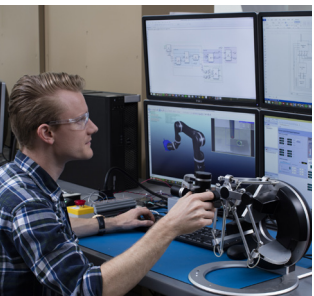
Engineering is not just about problem-solving; it's about problem-solving and taking action. In UW ME, we're proud of our commitment to impact. Our faculty and students are developing solutions to key challenges in health care, energy and manufacturing, and we're improving people's lives through our leadership in research and innovation.



Labs such as the **Ability and Innovation Lab** and **AMP Lab** aim to empower human mobility through engineering and design by working closely with patients, clinicians and families.



ME faculty are helping to innovate manufacturing through cutting-edge research in areas such as **machine learning, big data, digital manufacturing, new materials, composites and structures.**



The **Boeing Advanced Research Center** pairs Boeing engineers with students and faculty to develop solutions for aerospace products in the areas of automation, robotics and aircraft assembly.



ME researchers are advancing **cardiovascular health** and **cancer detection and treatment** through innovations in optical technologies, nanorobotics, medical device development, biomedical diagnostics and stem cell engineering.



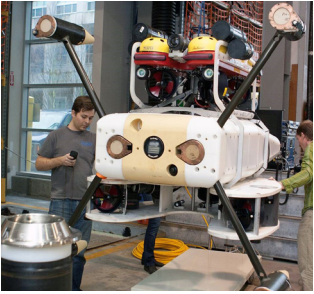
The **Clean Energy Institute** is working to accelerate the adoption of a clean energy future by advancing solar energy and electrical energy storage materials, devices and systems, as well as their integration with the grid.



The **Clean Cookstoves Lab** focuses on the testing, design and development of low-emissions, high efficiency wood-burning cookstoves for the developing world.



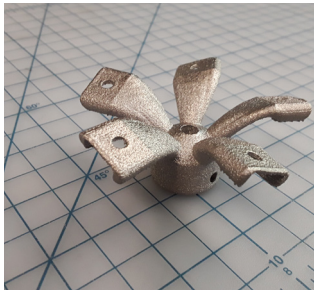
**Engineering Innovation in Health** is a year-long program in which engineering students and faculty partner with clinicians to design medical devices aimed toward lowering costs and improving care.



**Pacific Marine Energy Center** facilitates the commercialization of marine energy technology, informs regulatory and policy decisions, and works to close gaps in scientific understanding.



At the forefront of **robotics research**, ME faculty are exploring robot-human interaction, nanorobotics, robots for manufacturing, augmented and virtual reality, and autonomous systems.



ME faculty helped establish and continue to shape the fields of **rapid prototyping** and **advanced manufacturing.**