Undergraduate Program in

MECHANICAL ENGINEERING

What do Mechanical Engineers Do?

Mechanical engineers solve technical and global challenges facing society such as energy supply using renewable energy sources, transport infrastructure developing systems such as autonomous vehicles, bioengineering devices and technologies such as prosthetics and surgical control systems, and the manufacturing of advanced materials using robotic systems and automation science.

Mechanical Engineers' Broad Reach Enhances Quality of Life

Mechanical engineering graduates have a broad background enabling them to work in research and development for many industries that use mechanics, energy and heat, mathematics, design, and manufacturing.

Mechanical engineers work to solve contemporary problems such as:

- How can we design the next generation of sustainable and autonomous vehicles?
- How can we design and develop novel sustainable energy systems?
- Can we develop new revolutionary materials to reduce cost and increase product performance?
- How can physics, mathematics, and machine learning be integrated to solve complex problems related to the design and development of autonomous systems?

Facts About ME@UB

- Full-time faculty: 40
- The average entry-level salary for ME BS positions is **$63,707**. The median annual wage for MEs is **$90,160**
- Degrees offered: BS, MS, PhD
- Double major in Mechanical and Aerospace Engineering in 4.5 years
- A five-year combined BS Mechanical Engineering/ MBA program
- Minor in Manufacturing
- Minor in Robotics

Curriculum Overview

[FRESHMAN-SOPHOMORE]

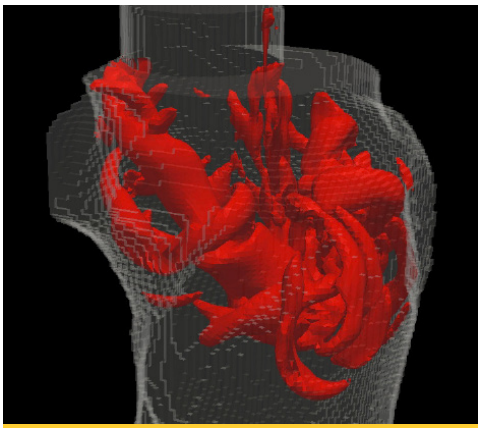
The first two years build the basic science and mathematics skills needed for the practice of mechanical engineering: chemistry; two semesters of physics; math through differential equations; mechanics and dynamics of rigid bodies; and mechanics of deformable bodies. Mechanical engineering courses start in the sophomore year.

[JUNIOR]

The third year develops the engineering sciences and provides the basic knowledge in areas such as fluid mechanics and heat transfer, computers and instrumentation, materials, and manufacturing processes, machines and mechanisms and computer-aided design (CAD). Hands-on laboratories build practical skills from the classroom instruction.

[SENIOR]

With the background acquired in the junior year, students are equipped to study design theory and methods and to engage in a capstone design experience. For the rest of the senior year, technical elective courses are available, both inside and outside the MAE department.



MAE researchers are using computational fluid dynamics (CFD) to improve the design and placement of cardiovascular devices such as artificial heart valves.

Specializations

There are numerous specializations available, including:

- Bioengineering
- Computational and Applied Mechanics
- Design and Manufacturing
- Dynamics and Control
- Fluid and Thermal Sciences
- Materials

Employment Outlook

Employment of mechanical engineers is projected to grow 7% through 2030, with more than 20,900 additional mechanical engineers required nationally.

(Source: https://www.bls.gov/ooh/architecture-and-engineering/mechanical-engineers.htm#tab-1)

Did You Know?

Mechanical engineering is one of the broadest engineering disciplines. A student who completes a mechanical engineering degree can successfully compete in design, development, manufacturing, and testing in a variety of industries. Our graduates have also been successful in continuing their studies at graduate programs at UB and in other top engineering programs across the country.

University at Buffalo
Department of Mechanical and Aerospace Engineering
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Did You Know?

Mechanical engineers create the processes and systems that drive technology and industry. They also work effectively in multidisciplinary teams. Major employers hiring our graduates include Tesla, Honda, Moog, NASA, General Electric, Ford, Lockheed-Martin, Moog, Hitachi, and Boeing.

Student Excellence

Amy Faville graduated Summa Cum Laude with a Bachelor of Science in mechanical engineering and a minor in manufacturing in June 2021. She was awarded the J. Scott Fleming Merit Award, Leaders in Excellence Scholarship and the University at Buffalo Alumnae Scholarship. During her studies, Amy served as a teaching assistant for fluid mechanics, heat transfer, and the freshman engineering course; participated in the Engineering Study Abroad program in Troyes (France); and was an active member of Theta Tau, a professional engineering fraternity. She is currently working at Fisher-Price as a product development engineer.

"Outside of classes, there are countless opportunities to get involved in engineering clubs, research or projects. This enables students to find not only their passions, but a strong network of diverse yet like-minded individuals."

Work Opportunities

Many of our students gain industrial experience during their undergraduate studies. Some students will find engineering-related employment in the summer. Others get experience through 3-credit internships. For many graduates, these experiences put them ahead in their job search and allowed them to hit the ground running when they started working.

Undergraduate Research

Undergraduates have the opportunity to work with ME faculty on research addressing important societal needs, such as innovative systems to provide renewable energy, the development of drones for search and rescue during disasters, and biomedical technologies to identify and prevent strokes.

Student Clubs and Activities

A number of student-led clubs and activities are available including:

- AIAA: American Institute of Aeronautics & Astronautics
- ASME: American Society of Mechanical Engineers
- PTS: Pi Tau Sigma
- SAE: Society of Automotive Engineers
- SWE: Society of Women Engineers
- UB Nanosat Lab
- UB SEDS: Students for the Exploration and Development of Space

Did You Know?

A BS in mechanical engineering provides a sound background for the pursuit of many professional opportunities. Graduates with a BS in ME have continued study in law school and medical school, in addition to continuing with graduate studies in ME. Others have obtained MBA degrees to pursue professional careers combining technology and business.

To apply, please visit **admissions.buffalo.edu**

Successful Alumni

Philip Odonkor (BS 2013, MS 2015, PhD 2019) Assistant Professor, School of Systems and Enterprises at Stevens Institute of Technology, develops and utilizes data-driven methodologies to enable efficient and sustainable energy use within built environments. He is a member of ASME and received the SUNY Chancellor's Award for Student Excellence in 2019.

Award-Winning Faculty

- **2** Endowed Professors
- **16** Professional Society Fellows
- **8** NSF Career Awards
- **4** DoD Young Investigator Awards
- **1** SUNY Distinguished Professor
- **1** SUNY Distinguished Teaching Professor
- **2** SUNY Chancellor's Awards for Excellence in Scholarship and Creative Activities
- **5** SUNY Chancellor's Awards for Excellence in Teaching
- **1** UB Distinguished Professor
- **5** UB Exceptional Scholar Sustained Achievement Awards
- **3** UB Exceptional Scholar Young Investigator Awards
- **2** UB Teaching Innovation Awards
- **2** UB President Emeritus and Mrs. Myerson Award for Distinguished Undergraduate Teaching and Mentoring

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