

UB Department of Mechanical and Aerospace Engineering (MAE) BS in Mechanical Engineering (ME)

• Facts About MAE@UB

- Full-time faculty: 27
- Average BS ME starting salary: \$58,766, median income for ME's is \$74,920 *
- Degrees offered: BS, MS, PhD
- A five-year BS Mechanical Engineering + MBA program is available

• What Do Mechanical Engineers Do?

Mechanical engineers use principles of energy, mechanics, and materials in “product engineering” to design and manufacture machines and devices of all types. Examples include:

- Power-producing machines
- Combustion engines
- Automotive vehicles and systems of transportation
- Steam and gas turbines
- Industrial production equipment
- Material handling systems
- Robots used in manufacturing
- Biomedical devices
- Control and sensor devices
- Pollution control devices

• 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:

- How can we design automobiles for increased efficiency and mixed fuel sources?
- How can we improve the efficiency and decrease the noise of aircraft engines?
- Can we substitute less expensive materials and processes while retaining the high quality of the final manufactured product?
- Can computer simulations be applied to speed up design and eliminate costly testing and prototyping?

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.

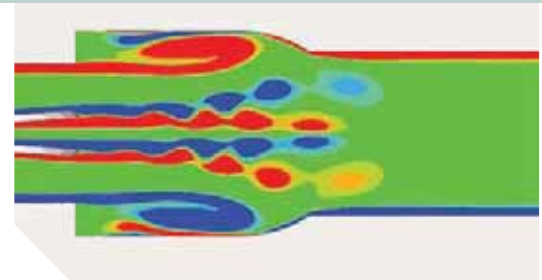
Senior

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 in- and outside the MAE department.

Specializations

Nine separate specializations are available, which students may pursue by choosing from technical electives. Some of these are:

- Dynamic Systems and Control
- Design and Manufacturing
- CAD/CAE and Engineering Computation
- Energy and Applied Thermodynamics
- Bioengineering



Using computational fluid dynamics (CFD), UB MAE researchers are calculating the flow field in an artificial aortic heart valve, in order to improve its design and placement.

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 highly competitive engineering programs across the country.

Did You Know?

Mechanical engineering is expected to show stable employment growth of 6% per year through 2018, with more than 14,000 additional mechanical engineers required nationally.*

*(Source: <http://www.bls.gov/oco/ocos027.htm>.)

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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 DuPont, IBM, Praxair, General Electric, Dresser-Rand, General Motors, U.S. Navy, Lockheed-Martin, Moog, and Kodak.



Student Excellence

Kevin Ruggirello recently completed a dual major with honors in both Mechanical Engineering and Aerospace Engineering. He is studying for an a PhD in the area of Fluid and Thermal Sciences, with research in the ignition of aluminum particles from post-detonation shock, focusing on explosives.

"I chose UB because, as an undergraduate here, I knew I would receive a very high quality of education. Also, by weighing its quality with the cost of education at other universities, choosing UB was an easy decision to make."

Work Opportunities

Many of our students gain industrial experience during their undergraduate studies. Some students find engineering-related employment in the summer. Others get experience through 3-credit internships, through a co-op, or by participating in UB Engineering's unique Engineering Career Institute (ECI). 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

UB is also a premier research institution that caters to its undergraduates for the finest engineering education. The ME program offers many opportunities for undergraduates to participate in state-of-the-art research projects. Participants are immersed in a collaborative learning and research environment led by faculty and graduate student mentors. They also report that some of their most meaningful lessons have come about when they are allowed to develop and follow their own ideas—and to learn from their own mistakes.

Student Clubs and Activities

ME students at UB actively participate in projects and activities run by the American Society of Mechanical Engineers (ASME) and the Society of Automotive Engineers (SAE). Both of these groups introduce new ME students to educational and fun activities, actively recruiting students at all levels to participate in national design challenges. Students compete with other universities, and seek to outdo the previous year's ME class. SAE projects have included design and fabrication of Formula (race) cars, Mini-Baja dune buggies, and environmentally clean snowmobiles. ASME projects have included human-powered vehicles and solar-powered boats.



Members of UB's SAE mini-Baja team.

"SAE members get hands-on experience in design, construction, and marketing of a prototype vehicle. We have sent teams to competitions where over a hundred teams from over sixteen different countries are all trying to prove they built the best car. Our mini-Baja team placed 9th out of 60 teams at the RIT aquatic event in 2011. Our clean snowmobile team place 4th out of 15 teams at University of Michigan in 2011. These are unparalleled experiences for students."

Nathan King, SAE President

Successful Alumni

Catherine (Kitty) Pilarz (BS '80)



Senior Director, Worldwide Product Safety, Mattel, Inc, responsible for safety policies for Mattel and Fisher Price; Chairman, Board of Directors and Fellow of ASTM International, Vice-Chair of ASTM F15 Executive Committee; in 2010, she received the ASTM Dana Award in recognition of her commitment to children's safety through development of global standards. Pilarz serves on numerous committees that oversee safety standard development for children's products. She is also a board member and past president of the International Consumer Product Health and Safety Organization (ICPHSO).

Award-Winning Faculty

ME faculty at UB have received recognition for both teaching and research accomplishments, with over 40 awards from national and international organizations for excellence in research and in teaching. Research awards have come from the National Science Foundation, the National Institutes of Health, and the Office of Naval Research, and international study awards have come from the J. William Fulbright and the Alexander von Humboldt Foundations.



Professor Kemper Lewis is Professor for Competitive Product and Process Design and Executive Director for NYSCEDII, the New York State Center for Engineering Design and Industrial Innovation. His many awards and honors include the NSF Career Award and the SUNY Chancellor's Award for Excellence in Teaching.

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.

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