

# Mechanical Engineering & Materials Science

## About Mechanical Engineering & Materials Science

The Department of Mechanical Engineering & Materials Science (MEMS) offers the Bachelor of Science in Mechanical Engineering (BSME) and the Bachelor of Science in Applied Science (Mechanical Engineering). In addition, minors in aerospace engineering, energy engineering, environmental engineering science, materials science & engineering, nanoscale science & engineering, robotics, mechatronics, and mechanical engineering as well as in related scientific and engineering fields are available to students.

The MEMS curriculum emphasizes the core principles of mechanics (i.e., the study of forces, materials and motion) that underlie mechanical engineering. The common curriculum during the student's early academic development encourages breadth of understanding, interdisciplinary thinking and creativity. During their first, sophomore and early junior years, students are focused on learning fundamental concepts in statics, dynamics, fluid mechanics and thermodynamics. During the junior and senior years, students choose electives that emphasize their specific interests and prepare them for a particular professional or academic career. The undergraduate curriculum for the BSME degree provides MEMS students with a strong base in fundamental mathematics, science and engineering. It exposes the students to diverse applications of mechanics and materials, and it provides them with the flexibility to explore creative ideas through undergraduate research and project-based courses.

Mechanical engineering is critical to a variety of important emerging technologies. Mechanical engineers design and develop artificial organs, prosthetic limbs, robotic devices, adaptive materials, efficient propulsion mechanisms, high-performance aerospace structures, and advanced renewable energy systems. The core concepts of mechanics, thermal systems and materials science are at the heart of these technologies.

## Mission Statement

The MEMS faculty is committed to providing the best possible undergraduate mechanical engineering education possible. We strive to nurture the intellectual, professional and personal development of the students, to continually improve the curriculum, to be professionally current, and to maintain state-of-the-art facilities for teaching and learning.

We seek to prepare students for professional practice with a scientifically grounded foundation in the major topics of mechanical engineering: solid mechanics, mechanical design, dynamics and vibrations, systems control, fluid mechanics, thermal science and materials science.

## Graduate Programs

The department offers programs for graduate study at both the master's and doctoral levels. All programs are designed to direct advanced study into an area of specialization and original research that includes recent scientific and technological advances.

A graduate degree can provide significant advantages and rewards to a mechanical engineer, including increased income and a wider range of career options. Graduate programs include professional, course-option master's degrees (MS and MEng) as well as research-based master's (MS) and doctoral (PhD) degrees. The undergraduate curriculum provides an excellent foundation for graduate study, and a careful selection of electives during the third and fourth years can facilitate the transition to graduate work. The master's degrees can be pursued on a part-time or full-time basis, whereas the PhD degrees are typically pursued by full-time students.

Website: <https://mems.wustl.edu/academics/undergraduate/index.html>