mechanical engineering

AT A GLANCE
2011-12
MECHANICAL ENGINEERING
The Department of Mechanical Engineering is the oldest department in the College of Engineering. It was established in 1885, prior to the formal establishment of the college. We have the largest undergraduate program in the College of Engineering.

Mechanical engineers have been very successful in the job market, following exciting careers in the automotive, aerospace, manufacturing, design and construction, and paper and plastics industries, as well as medicine, product design, and law.

Through the design/manufacturing core program, consisting of four required courses, students gain in-depth knowledge of the field of mechanical engineering and what it takes to be an engineer in the real world. This experience within the design/build/test atmosphere culminates in a capstone design course. Students in this course utilize all the skills taught in the mechanical engineering program to address real-world problems posed by industrial representatives, propose possible solutions to a problem, and focus on the best solution to build and test. Industrial sponsors continue to support this program because of its positive impact on their operations.

The design, build, and test approach in the department has been critical in advancing our American Society of Mechanical Engineers student chapter to 6 consecutive wins in regional competition, 1st-place finishes in 12 out of the past 16 regionals, and 1st-place, 4th-place, 6th-place, and 8th-place finishes in world competitions.

UNDERGRADUATE PROGRAM
Undergraduate students are an essential part of a stimulating learning community that enjoys up-to-date equipment and facilities.

The Department of Mechanical Engineering's program provides:

• A math-science base
• An integrated design/manufacturing core
• An integrated communication program
• Global engineering education

The key elements of the program incorporate:

• Multidisciplinary, open-ended design problems
• Real-world experiences and practical problem solving
• Design/build/test experience—teamwork

GRADUATE PROGRAM
Graduate students can expect a high-quality education built on our excellent faculty. Typically, 33 senior-level and 28 graduate-level courses are offered by the department. Our graduate students also benefit from research grants from industry and government as they work with the faculty.

The department in 2010 provided teaching assistantship support totaling over $460,000; and research assistantship support from external grants totaling almost $1.1 million.
FACULTY AND STAFF

The Department of Mechanical Engineering is composed of 35 faculty and 34 academic specialists, research associates, and support staff.

Faculty achievements:

1. 14 are fellows of professional societies, including 3 who are fellows of at least 2 societies.
2. 2 are high-level officers of international societies.
3. 4 are University Distinguished Professors.
4. Faculty and staff published over 100 journal articles and over 100 conference papers last year.

RESEARCH

We have seen a strong increase in research activity over the last several years. Accompanying the increase in research expenditures, the department has grown in the number of supported graduate students, the number of publications, and the availability of state-of-the-art laboratory equipment. Our research encompasses the core disciplines of fluid mechanics, heat transfer, engineering mechanics, system dynamics, controls, and vibrations.

Research centers in the Department of Mechanical Engineering include:

- Energy and Automotive Research Laboratories
- Composite Vehicle Research Center
- Collaborative Center of Excellence in Aeronautical Sciences
- Industry/University Cooperative Research Center on Advanced Cutting Tool Technology

Current research labs include:

- Advanced Manufacturing Research Laboratory
- Automotive Controls Laboratory
- Biomechanical Design Research Laboratory
- Biothermomechanics Laboratory
- Cardiovascular and Tissue Mechanics Research Laboratory
- Combustion Laboratory
- Computational Design and Manufacturing Laboratory
- Computational Fluid Dynamics Laboratory
- Controls Research Laboratory
- Laser Diagnostics for Energy and Environment Laboratory
- Optical Measurements Laboratory
- Orthopaedic Biomechanics Laboratory
- Turbomachinery Laboratory
- Turbulent Mixing and Unsteady Aerodynamics Laboratory
- Turbulent Shear Flow Laboratory
- Vibrations Research Laboratory

RESEARCH PARTNERS

The Department of Mechanical Engineering focuses on the importance of engineers in the real world. Collaboration with strategic partners on a wide range of issues such as recruitment, curriculum development, internships, and research provides students with a real-world perspective.

Some of our research partners include:

- Air Force Office of Scientific Research
- Air Force Research Laboratory
- Army Research Office
- Chrysler
- DIFTI
- Ford Motor Company
- General Motors Corporation
- MAHLE
- NASA
- National Institutes of Health
- National Science Foundation
- Office of Naval Research
- U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC)
- U.S. Department of Agriculture
- U.S. Department of Energy
PROGRAM HIGHLIGHTS

• An ABET-accredited program provides courses in design and manufacturing, dynamics and controls, mechanics and materials, thermo fluids, laboratory, and communication, as well as math, science, and humanities.
• The average starting salary for recent graduates was $57,221.
• Study abroad programs include Copenhagen, Denmark; Lyon, France; Aachen, Germany; Seoul, Korea; Taipei, Taiwan; and Edinburgh, UK.
• Mechanical engineering majors represent 30% of the College of Engineering’s experiential learning participants.
• The department has a strong communication program that incorporates writing/speaking activities in all required courses.
• The department is a charter member of the PACE program (Partners for the Advancement of CAD/CAM/CAE Education).
• Faculty provide opportunities for undergraduate involvement in research.
• The department awarded $120,000 in undergraduate scholarships in 2010.
• The department places a strong emphasis on mechanical engineering–focused extracurricular activities through Formula SAE, Baja, and solar car teams.

NUMBERS AT A GLANCE

Faculty ................................................. 35
Undergraduates .................................... 725
Graduate Students
   MS ................................................. 58
   PhD ............................................. 86
Degrees awarded
   BS .................................................. 117
   MS ............................................... 11
   PhD ............................................. 8
Grants in force ...................................... 116
Research expenditures ....................... $11,340,000
Patents awarded ................................. 3

FOR MORE INFORMATION

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