

COLLEGE OF
ENGINEERING

Department of Mechanical Engineering
Michigan State University
2555 Engineering Building
East Lansing, MI 48824-1226

mechanical
engineering



AT A GLANCE
2009

MICHIGAN STATE
UNIVERSITY

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



College of Engineering building

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, and 6th-place finishes in world competitions.

The Department of Mechanical Engineering has recently dedicated a new 29,000-sq.-ft. research facility—the Energy & Automotive Research Laboratories. This facility is one of just a few in the United States doing cutting-edge research in these areas.

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 2007/2008 provided teaching assistantship support totaling over \$580,000; and research assistantship support from external grants totaling almost \$1.5 million.



Ross Weaver, ME junior



FACULTY AND STAFF

The Department of Mechanical Engineering is composed of 40 faculty and 21 academic specialists, research associates, and support staff.

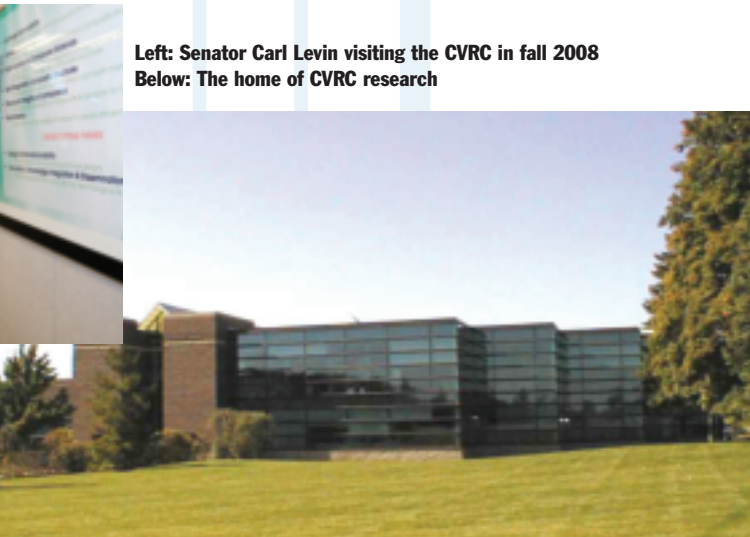
Faculty achievements:

- 20 are fellows of professional societies, including 3 who are fellows of at least 2 societies.
- 4 are high-level officers of international societies, including a member of the ASME Board of Governors.
- 4 are University Distinguished Professors.
- 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.

Left: Senator Carl Levin visiting the CVRC in fall 2008
Below: The home of CVRC research



Current research labs include:

- Advanced Manufacturing
- Biomechanical Design
- Biothermomechanics
- Combustion
- Computational Design and Manufacturing
- Computational Fluid Dynamics
- Computational Structural Mechanics
- Controls Research
- Engine Research
- Impact Dynamics
- Optical Measurements
- Thermal Engineering
- Turbomachinery
- Turbulent Mixing
- Turbulent Shear Flow
- Vibrations Research

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
- Alcoa
- Army Research Office
- Chrysler
- DIFTI
- Ford Motor Company
- General Electric
- General Motors Corporation
- KI-TECH
- NASA
- National Science Foundation
- Office of Naval Research
- USDA
- Valeo

PROGRAM HIGHLIGHTS

- ABET-accredited instruction is provided in design and manufacturing, dynamics and controls, mechanics and materials, thermo fluids, laboratory, and communication courses, as well as in math, science, and humanities.
- The average starting salary for recent graduates was \$57,500.
- Study abroad programs include Aachen, Germany; Seoul, Korea; Lyon, France; Edinburgh, UK; and Taipei, Taiwan.
- Mechanical engineering majors represent 30% of the College of Engineering's co-op 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).
- The department continually assesses its educational program through the ME Undergraduate Continuous Quality Improvement Program.
- Faculty provide opportunities for undergraduate involvement in research.
- The department awarded \$72,000 in undergraduate scholarships in 2008.
- Department faculty members are active in a wide range of research.



Baja racing

NUMBERS AT A GLANCE

Faculty	40
Undergraduates	583
Graduate Students	
MS	60
PhD	56
Degrees awarded	
BS	134
MS	21
PhD	6
Grants in force	95
Research expenditures	\$5,350,000
Patents awarded	3



ME 371 design project

FOR MORE INFORMATION

Eann Patterson, Chairperson
 Department of Mechanical Engineering
 Michigan State University
 2555 Engineering Building • East Lansing, MI 48824-1226
 Phone: (517) 355-5131 • Fax: (517) 353-1750
 E-mail: mechair@egr.msu.edu
 Web site: www.egr.msu.edu/me/