college of engineering

AT A GLANCE
2010
THE COLLEGE OF ENGINEERING

The College of Engineering is one of the largest and oldest colleges on the MSU campus. What began as a single field of study—Mechanic Arts—in 1885 has grown to a six-department college with 168 faculty and nearly 3,000 undergraduate students. Nine undergraduate degree programs are offered, plus the opportunity to further pursue special interests with a variety of concentrations and cognates, ranging from biomedical engineering to environmental engineering to supply chain management. Nine graduate degree programs are available.

What sets Spartan Engineers apart is the way their skills are put together. We believe that being an engineer in the twenty-first century means more than just developing, designing, and building. All engineers do that, and Spartan Engineers are no exception. But at MSU, a process we call Spartaneering prepares our graduates to open the doors to excellence and innovation from day one on the job.

DEPARTMENTS

- Biosystems and Agricultural Engineering
- Chemical Engineering and Materials Science
- Civil and Environmental Engineering
- Computer Science and Engineering
- Electrical and Computer Engineering
- Mechanical Engineering

RESIDENTIAL EXPERIENCE

The Residential Experience for Spartan Engineering is a living-learning community that couples intensive classroom study with hands-on learning. Special seminars, tutoring, reserved class sections, networking opportunities, and corporate-sponsored themed floors are just a few of the advantages of the Residential Experience.

UNDERGRADUATE PROGRAM

Approximately 3,000 undergraduate students are enrolled and nearly 500 bachelor’s degrees are awarded annually in applied engineering sciences, biosystems engineering, chemical engineering, civil engineering, computer engineering, computer science, electrical engineering, materials science and engineering, and mechanical engineering.

GRADUATE PROGRAM

Each year, approximately 800 students are enrolled in our advanced degree programs and nearly 200 MS and PhD degrees are awarded. Graduate programs are offered in biosystems engineering, chemical engineering, civil engineering, computer science, electrical engineering, environmental engineering, materials science, mechanical engineering, and engineering mechanics.

COLLEGE HIGHLIGHTS

- MSU has been awarded $25 million to establish BEACON, an NSF Science and Technology Center for the Study of Evolution in Action. MSU is among five universities selected by NSF in 2010 to lead one of these highly coveted Science and Technology Centers.
- With U.S. Department of Energy funding, a team of researchers is developing a hyper-efficient engine known as a wave disk generator (WDG). It uses a turbo combustion “shock wave” technique to convert gaseous or liquid fuel sources to electrical power. This technology has the potential to increase automotive fuel efficiency by five times, reduce costs by 30 percent, and reduce...
carbon dioxide emissions by as much as 95 percent in comparison with today’s internal combustion vehicle engines.

- The new Center for Engineering Education Research (CEER) @ MSU provides a focus for expanding engineering education research in the college, engaging more faculty in engineering education research, and working collaboratively with colleagues in other colleges across campus.

- The U.S. Department of Energy tapped MSU to lead a new Energy Frontier Research Center (EFRC), one of 46 established nationwide. MSU’s EFRC, funded at $12.5 over five years, will focus on thermoelectrics.

- CAESRT, the new Center for Alternative Energy Storage Research and Technology, conducts innovative, high-impact fundamental and applied research in materials and technologies for energy storage devices and systems. Research at CAESRT is coupled with efficient and effective technology transfer to industry and government.

- The Composite Vehicle Research Center is a U.S. Department of Defense–supported center of excellence for the design and testing of composite structures for lightweight, environmentally friendly, durable, and safe vehicles, with both military and civilian applications.

- The Structural Fire Testing Facility, the first of its kind in a U.S. university setting, draws faculty from other institutions and government agencies to work collectively with MSU faculty in developing new materials, sensors, and design methodologies that will ensure that our infrastructure withstands natural and man-made fires.

- In the past ten years, the College of Engineering has produced two Churchill Scholars, eight Goldwater Scholars, and a Gates Cambridge Scholar.

- The Center for Spartan Engineering assists students in obtaining their career goals through research experience, cooperative education, internships, service learning, and post-graduation employment. The Center offers K-12 outreach activities as well as seamless career exploration and connections for students, alumni, employers, and faculty.

PRIORITy RESEARCH AREAS

- Health
- Energy
- Sustainability
- Security
- Materials

RESEARCH CENTERS AND FACILITIES

For complete information, go to: www.egr.msu.edu/research/facility

- BEACON – an NSF Science and Technology Center for the Study of Evolution in Action
- Civil Infrastructure Lab
- Composite Materials and Structures Center
- Composite Vehicle Research Center
- Electron Microscopy Facility
- Energy & Automotive Research Laboratories
- High Performance Computing Center
- MDOT Pavement Research Center of Excellence
- Midwest Hazardous Substance Research Center
- MSU Fraunhofer Center for Coatings and Laser Applications
- National Center for Pavement Preservation (NCPP)
- NOAA Center of Excellence for Great Lakes and Human Health
- Protein Expression Lab
- Structural Fire Testing Facility
- ZELRI-MSU Power Research Center
RESEARCH AND CORPORATE PARTNERSHIPS

- Consumers Energy became the first corporate sponsor in the Engineering Theme Partnership program within the college’s Residential Experience for Spartan Engineering. Consumers Energy will present an engineering problem or theme each year, and then immerse students in learning about the industry. Student involvement could include developing ideas to address energy industry issues, leading environmental initiatives, job shadowing, and field trips to Consumers Energy facilities.

- Our graduates are recruited aggressively in Michigan and around the world. They work in every industry from aerospace to transportation, in every size company from Fortune 100 to small- and medium-sized Michigan-based companies, and in every state and country. Spartan Engineers are everywhere.

- MSU engineering students can go beyond classroom work and add an Undergraduate Research Experience to their educational program. This gives them the opportunity to work with leading researchers on cutting-edge solutions to modern technical dilemmas. Each year, more than 100 undergraduate research assistants enhance their education by working side by side with graduate students and faculty in engineering research labs.

- Nearly 80% of our undergraduate students voluntarily participate in an “experiential education” program prior to graduation. This includes traditional co-op and internship programs and summer work, as well as university research and study/work abroad.

FACULTY AND STAFF

The College of Engineering comprises 168 faculty and 127 academic specialists and support staff.

- 4 new faculty joined the college in 2009–10.
- Nearly every faculty member participates in undergraduate teaching.
- Most of our faculty hold leadership positions in professional societies and have been widely recognized for their accomplishments.

NUMBERS AT A GLANCE

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
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<tbody>
<tr>
<td>Faculty</td>
<td>168</td>
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<td>Undergraduates</td>
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<td>MS students</td>
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<td>PhD students</td>
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<td>Research expenditures (FY 2008–09)</td>
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FOR MORE INFORMATION

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