

WHAT IS MECHANICAL ENGINEERING?

Mechanical engineers research, design, develop, manufacture, and test tools, engines, machines, and other mechanical devices. They work on power-producing machines such as electric generators, internal combustion engines, and steam and gas turbines. They also develop and apply power-using and energy-conversion machines such as refrigeration and air-conditioning equipment, machine tools, material handling systems, elevators and escalators, industrial production equipment, and robots used in manufacturing. More recently, mechanical engineers have begun applying their knowledge to the development of biotech devices and therapeutic regimens to aid in patient health care.

Design teams in the automotive, aerospace, petrochemical and computer industries all include mechanical engineers. They use computers to accurately and efficiently perform computations and to model and simulate new designs as well as change

existing ones. Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) are used for design data processing and for turning the design into a product.

Mechanical engineering is considered by many to be the most broadly based of all engineering disciplines. Areas of specialization include:

- Applied mechanics
- Fluid mechanics
- Heat transfer
- Mechanical design
- Instrumentation
- Control systems
- Engines and power plants
- Pollution control
- Computer-aided design
- Biomechanics



WHY BECOME A MECHANICAL ENGINEER?

According to the U.S. Department of Labor's Occupational Outlook Handbook, mechanical engineers held about 227,000 jobs in 2006 with a projection of 235,000 in 2016. More than half of the jobs were in manufacturing - mostly in machinery, transportation equipment, computer and electronic products, and fabricated metal products.

Opportunities for mechanical engineers in manufacturing should increase as the demand for improved machinery and machine tools grows and as industrial machinery and processes become increasingly complex. Also, emerging technologies in biotechnology, materials science, and nanotechnology will create new job opportunities for mechanical engineers. Additional positions for mechanical engineers will arise because a degree in mechanical engineering provides versatility and often can be applied in other engineering specialties.

The National Association of Colleges and Employers reported that 2008-09 mechanical engineering graduates with a bachelor's degree received annual starting salary offers averaging \$58,766. Offers to those with a master's degree averaged \$66,158.

Mechanical engineers meet the challenges in their careers by applying technical knowledge, communication and teamwork skills, creativity, and an ability to understand and master new technologies.



MECHANICAL ENGINEERING AT J.B. SPEED SCHOOL

The Mechanical Engineering Department offers a Bachelor of Science Degree, including a cooperative education component, in four years and with one additional year a Master of Engineering Degree. Both the undergraduate and graduate programs are recognized by the Engineering Accreditation Commission of ABET.

As freshmen and sophomores, students develop a solid foundation in engineering principles along with a background in the arts, humanities, and social sciences. Class studies include mathematics, basic mechanics, thermal science, and fluid mechanics fundamentals. Theory and analytical skills are then put to practical use during a series of design-oriented classes that emphasize open-ended problems. Three semesters of on-the-job learning through the Cooperative Education Program give students hands-on experience.



Upperclassmen may participate in cutting edge research in automotive structural analysis, atmospheric dynamics, industrial energy conservation and pollution control, vibration and acoustics, biomechanics, and microfabrication, etc.

The department sponsors student chapters of the American Society of Mechanical Engineers (ASME), American Institute for Aeronautics and Astronautics (AIAA), Society of Automotive Engineers (SAE), and International Mechanical Engineering Honor Society, Pi Tau Sigma. AIAA, ASME, and SAE provide students with an opportunity to socialize with classmates and faculty, network with practicing mechanical engineers, tour industrial sites, learn specialized technical skills through internal short courses, and participate in regional and national professional meetings.

DEPARTMENT HIGHLIGHTS

- Courses are taught by experienced, qualified faculty who remain current in their fields, teach at all curriculum levels, and care about the success of students.
- Our student section of the Society of Automotive Engineers is active in Mini Baja and Formula SAE events around the country.
- Undergraduates are encouraged to attend and present results from their design and research projects at regional and national conferences.
- A 32-workstation computer lab with up-to-date hardware and software is available for instruction and student use.
- Students have access to machine shop facilities for fabrication of design prototypes.
- An endowed chair faculty member with research and teaching expertise in biomechanics, wheel chair safety, and pediatric trauma recently joined the department.

For Additional Information:

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