

MECHANICAL ENGINEERING

Wallace H. Coulter School of Engineering

“Technology Serving Humanity”

“Clarkson provided me with the opportunity to solve challenging and valuable real-world problems from the start. The SPEED program shines as an example of Clarkson’s commitment to hands-on, project-based, interdisciplinary team learning.”

**Jonathan P. Ingraham '03, '05 (M.S.)
Mechanical Engineering**



What is Mechanical Engineering?

Mechanical engineers apply the principles of force, energy and motion to the design and manufacture of mechanical systems. Mechanical engineers make an impact in almost every aspect of modern society, due to their vital roles in the design and production of all material goods.

Areas of study include machine design, robotics, manufacturing processes, thermodynamics and engines, fluid flow, composite materials properties, dynamics, acoustics, finite element analysis, and computer-aided design.

What kinds of careers are possible?

Mechanical Engineering graduates are at work on everything from submarines to spacecraft, from manufacturing the most delicate integrated circuit wafers to the strongest bridges. Automotive engineers, for example, are involved in every aspect of vehicle design, from creating an aerodynamic exterior to the details of wiring and engine efficiency under the hood.

Fields include: biomechanics and assistive technologies for people with disabilities; automation and robotics systems; engine and propulsion systems; design of ships, submarines, aircraft and spacecraft.

Mechanical engineers help create materials that are stronger, lighter or more flexible; and they also discover exciting new applications for those materials. They design better, more energy efficient production processes. They enjoy fulfilling careers in industry, government and education.

Why Clarkson for engineering?

U.S. News & World Report ranks Clarkson in its 2006 Best Undergraduate Engineering

Programs at schools whose highest degree is a Ph.D. The placement rate for our engineers is one of the nation’s highest. Our graduates are sought both for their strong technical skills and their versatility. A Clarkson engineering education builds abilities in teamwork, management, communication and creative problem solving. Our graduates are accepted in the best advanced degree programs in the country, including our own. Among others: Berkeley, Cal Tech, Dartmouth, Illinois, Michigan, MIT, and Stanford.

Teaching emphasized in a research environment

Clarkson combines two distinctive strengths that benefit students: personalized teaching and high-powered research.

With a 16:1 faculty-to-student ratio, our professors get to know students as individuals. On the other hand, these faculty members also conduct research in areas of vital importance in mechanical engineering — and sometimes involve junior or senior undergraduates in the process.

Project-based learning

Clarkson takes a project-based approach to learning. Because you focus on the creative application of knowledge and skills to solve practical, real-world problems, you gain:

- A strong, hands-on foundation in the basics
- Teamwork and leadership skills
- Practice in creative problem solving
- Techniques in research and analysis
- Skills in applying what you know

All seniors take a two-semester integrated design course that brings these components together. And at all levels, students enjoy the personal attention that only an undergraduate-centered school can provide.

A strong, practical curriculum

Our curriculum prepares you to tackle professional challenges associated with the design and manufacture of mechanical systems. The first two years cover mathematics, physics, chemistry and foundation engineering courses. In the third and fourth years, you take courses in specialized areas such as fluid mechanics and advanced mechanics of materials. During the senior year, capstone teams bring together all of the components of Clarkson's undergraduate mechanical engineering education as students design, build and test a mechanical device that meets real needs. Imagine how a team of Clarkson mechanical engineering students felt after successfully inventing and building the Zoot Scoot, a mobile cart with a hand controller that can be driven by people with severe disabilities. A prototype is now being used by students who were previously unable to operate even a motorized wheelchair, and who are enjoying mobility for the first time.

Undergraduate research

Opportunities may also exist for junior and senior mechanical engineering majors to participate in research projects. For example, a team of seniors took additional wind tunnel data for a project involving drag reduction on a tractor trailer. The Honors, CSTEP, and McNair programs also include research opportunities.

Professional specializations

You can develop specialization by completing a group of related courses. These include: Computer Applications, Fluid and Thermal Sciences, Materials and Manufacturing, and Solid Mechanics.

Concentrations are available in Manufacturing Engineering, Materials Engineering, and Biomedical and Rehabilitation Engineering, with a Dean's Certificate for successful completion. A minor in Mathematics is also available.

Team competitions in engineering design

Clarkson students sharpen their skills in creative problem solving, collaboration, communication and leadership through team competitions. These are organized through an umbrella program called SPEED (Student Projects for Engineering Experience and Design). Choose from among 15 different events involving complex real-world problems that you tackle in hands-on, multidisciplinary competitions. Those of particular interest to mechanical engineering students include:

- Design, Build and Fly
- FIRST Robotics
- Formula SAE
- Mini-Baja
- Clean Snowmobile

Areas of faculty research

Areas in which faculty are pursuing research include:

- Composite materials
- Metal plasticity and fatigue
- Welding metallurgy
- Aerosol droplet behavior

- Computational fluid dynamics
- Wind energy
- Automobile exhaust energy recovery

What kinds of equipment can I use?

You will do experiments requiring the use of material testing systems, a complete machine shop and welding area, and our motion control and robotics lab.

You will also have access to our 7,000-sq.-ft. Multidisciplinary Engineering and Project Laboratory and the Computer and Design Lab equipped with CAD/CAM and GIS. These are located in Clarkson's Center for Advanced Materials Processing (CAMP).

Co-ops and internships

Through our Career Center, you can participate in a paid, on-the-job experience as a co-op student or intern.

Companies recruiting Clarkson mechanical engineers

Among the companies that recruit our graduates are:

- Babcock & Wilcox
- Exxon Mobile
- General Motors
- Corning
- IBM
- General Electric
- Pratt & Whitney
- Xerox

www.clarkson.edu/mae

FACTS

Location — Historic Potsdam, N.Y. (Pop. 9,500), near the Adirondack Mountains and St. Lawrence River

Campus — 640 wooded acres, 47 buildings

Enrollment — 2,648 undergraduates, 397 graduate students

Students — Men and women from 34 states and 40 countries; 70% from the top quarter of their high school class

Faculty — 190

Student/faculty ratio — 16:1

Academics — Business, Engineering, Health Sciences, Liberal Arts, Physical Therapy, Sciences

Activities — More than 80 clubs

Sports — 21 varsity and 9 intramural sports

Financial Assistance — 90% of all students receive some form of financial aid

SCHEDULE A VISIT

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