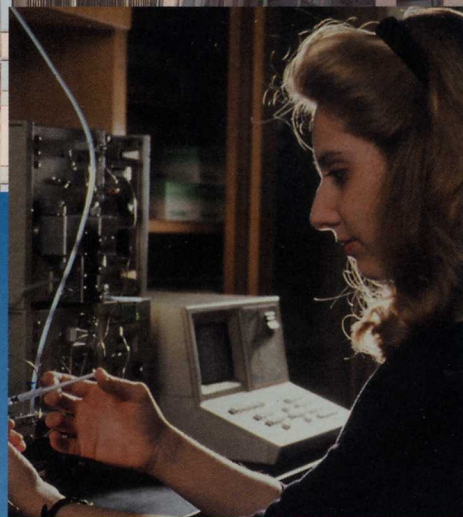
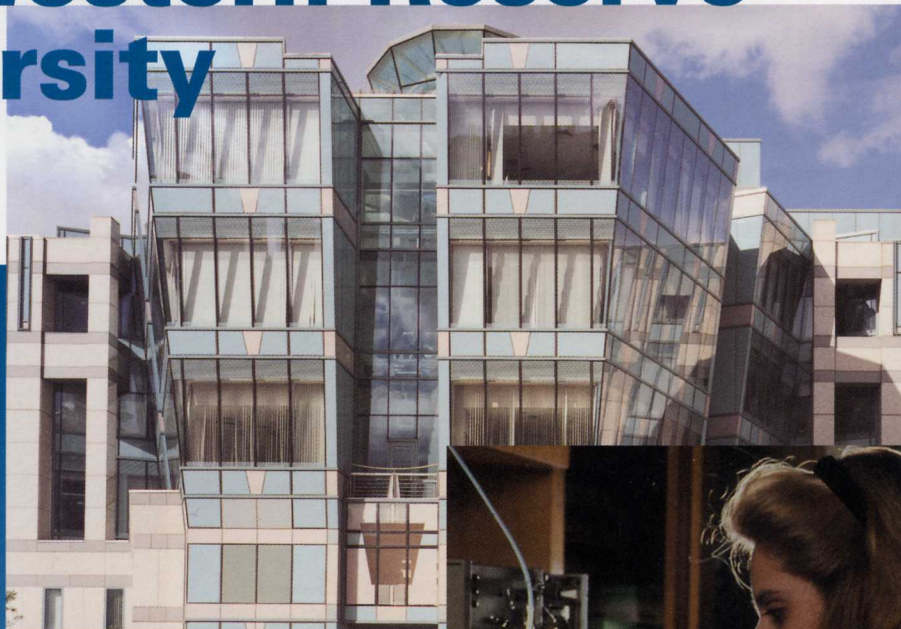


Case Western Reserve University





Experience Engineering

Case Western Reserve University offers you one of the country's top undergraduate engineering programs, excellence you experience through a curriculum that focuses on five core values:

- Mastery of fundamentals
- Creativity
- Societal awareness
- Leadership skills, such as communication, multidisciplinary teamwork, and an awareness of business issues
- Professionalism, including ethics, integrity, and community

Your engineering education at CWRU also emphasizes applied learning. Options abound in your courses, internships, and co-op assignments—even some in other countries.

Experiential Classes

Your education in the CWRU Case School of Engineering begins with interactive course work.

- **Engineering 101** allows you to gain real-world engineering design experience through community service activities; past projects have included constructing an indoor greenhouse for an environmental education program at an inner-city recreation center, designing marionettes for use by inner-city children with severe physical disabilities, and developing a flood gauge for use in a watershed stewardship project sponsored by a local nature center
- **Engineering 131**, a course taken by all engineering freshmen, teaches computer programming in the context of robots; students program robots to perform a variety of tasks, including synchronized dancing
- **Electrical Engineering 295/395** is a new course in which you work in interdisciplinary teams to design, build, and deploy technology-based solutions that aid the community

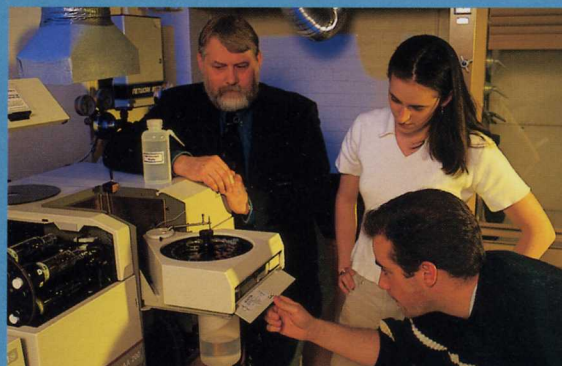
Global Exchange for Engineering Education

You have access to international education and internships as part of the Global Exchange for Engineering Education (GE3) program. Through the GE3 program, you receive academic credit for courses taken at overseas member institutions and gain real-world work experience in an internship in a foreign setting for a summer, semester, or academic year. You can choose from more than seventy universities in thirteen countries including Austria, Denmark, France, Germany, Mexico, Singapore, Turkey, and the United Kingdom.

Senior Design Project

As a senior, you complete a one-semester or two-semester engineering design project. These projects, pursued individually or in small teams, involve frequent interaction with a faculty advisor and often feature real-world applications. Examples of student-designed projects include:

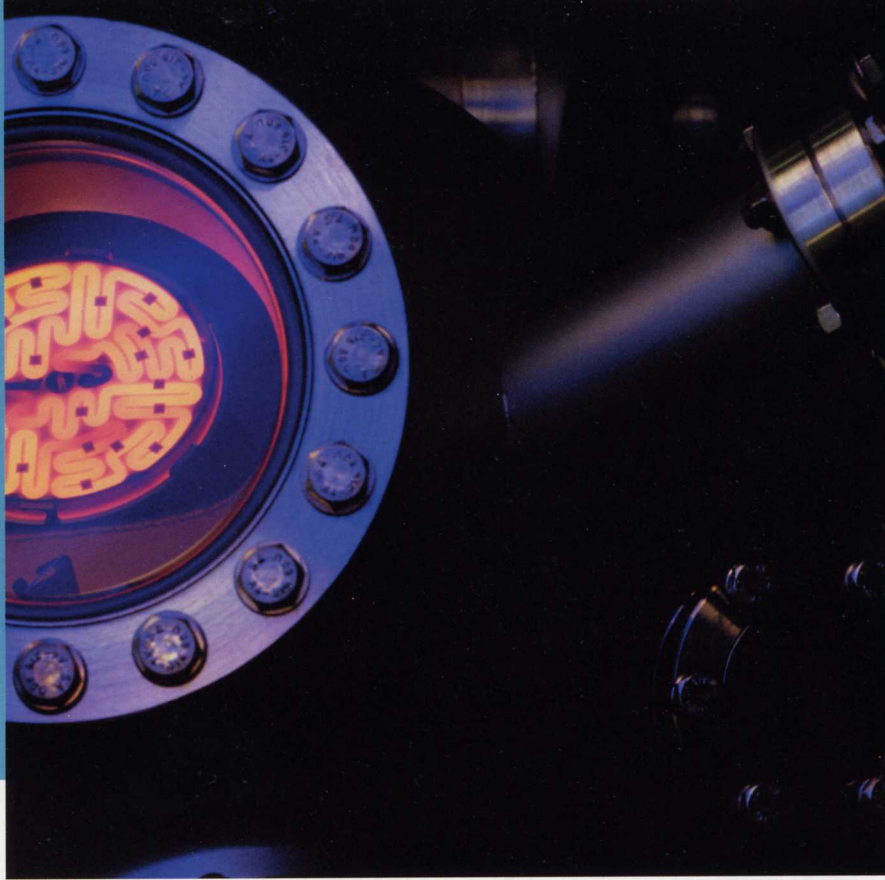
- Call waiting for a computer modem
- Crawling Assist Baby Board, or CRABB, which senses when a baby tries to move and then takes him or her in that direction
- Remote car finder
- "Smartcharger" for 12/16V batteries
- Computer-controlled drink mixer



Experience **Co-op Education**

You can work full-time for two, seven month periods in real-world engineering settings as part of the Case School of Engineering Cooperative Education Program, which is one of only eleven accredited by the Accreditation Council for Cooperative Education. More than 650 companies across the country ask for CWRU co-op students. These businesses include Accenture, BF Goodrich, General Electric Company, Goodyear Tire & Rubber, Hewlett-Packard Company, Honda of America, Intel Corporation, Invacare, Mead Paper Company, Pratt & Whitney, Picker International, the U.S. Department of Energy, and Xerox Corporation.





Advanced Study

CWRU's engineering programs not only help you get ahead in your career, but also help you get a head start on an advanced degree. Many CWRU engineering students go on to graduate schools and professional schools.

- A unique five-year combined degree program provides you with a Bachelor of Science in Engineering as well as a Master's in Engineering and Management
- You can earn an accelerated dual degree through a five-year combined B.S./M.S. program

Extracurricular Activities

You also have access to fun and functional engineering experiences on campus through student activities and organizations.

- Engineers Week includes hands-on engineering contests like creating robots out of Legos, making wooden airplanes and toothpick towers, racing veggie vehicles, and participating in an egg-drop competition and ethics challenge
- A new campus lecture series focuses on entrepreneurship in engineering.
- Eta Kappa Nu, Sigma Xi, and Tau Beta Pi are engineering honor societies with chapters at CWRU
- Engineering student groups include:
 - American Institute of Aeronautics and Astronautics
 - American Institute of Chemical Engineers
 - American Society of Civil Engineers
 - American Society of Mechanical Engineers
 - Association for Computing Machinery
 - Biomedical Engineering Society
 - Institute of Electrical and Electronics Engineers
 - National Society of Black Engineers
 - Society of Plastics Engineers
 - Society of Women Engineers
 - Students for the Exploration and Development of Space
 - Systems and Industrial Engineering Students Association
 - Undergraduate Materials Society



As a co-op student, you are paid for your work, earning \$1,900–\$4,000 a month. You are not a trainee or apprentice in your co-op position. You are essentially a full-time employee, working on important projects like these:

Alaskan Underwater Expedition

Computer science engineering major Alex Derbes spent his co-op working at the northernmost tip of Alaska, utilizing nationwide Web chats to disseminate information from an expedition with the National Oceanic and Atmospheric Administration (NOAA) West Coast and Polar Regions Undersea Research Center, Santa Clara University, NASA, and the U.S. Coast Guard. Scientists from these organizations have tried to locate the New Bedford Whaling fleet, which became trapped in the waters near Icy Cape in 1871 and sunk.

U.S. Military Mission

Amy Ballentine, a polymer engineering major, worked with Exxon Company on one of her two co-ops. She was stationed in their Southwest Grease Products plant near Pittsburgh, the largest manufacturer of proprietary grease products in the country. In addition to other responsibilities, Amy's primary project was creating and manufacturing grease based on polyurea in a lithium surfactant, a grease requested by U.S. military officials for use in extreme cold climates.

Deep Space Transmissions

Electrical engineering major Jeremy Protas served in a co-op at Jet Propulsion Laboratory in Pasadena, California, one of fifteen NASA complexes in the United States and the center of NASA's planetary exploration program. Jeremy worked within the Transmitter Group, which is responsible for creating and maintaining the transmitters for a worldwide system of antennas that communicate with NASA's planetary science missions. Jeremy was also involved with a wireless power transmission project under contract by a group working with the Chernobyl power plant.

Published Author

David Dinsmoor, a biomedical engineering major, chose Medtronic in Minneapolis, Minnesota, for both of his co-ops. His first was in atrial fibrillation research, which led to his becoming a published author while still an undergraduate. He has been included among those credited with researching and writing an article published in *PACE*, the journal of the North American Society for Pacing Electrophysiology, and *Circulation*, the journal of the American Heart Association. During his second stint at Medtronic, he worked in functional stimulation product development, in which he helped develop a wireless programmer for implanted neurological medical devices.

Other engineering students' co-op experiences include:

- Developing software and problem-solving at IBM Corp
- Designing tool path graphics for computerized numerical controllers that run automated systems in factories at Rockwell Automation
- Working on a confidential project concerning the use of composites in the PVC products produced at PolyOne
- Trouble-shooting the mixing and reacting of raw materials in order to make desired final products at Lubrizol Corporation



Experience Cutting-edge Research

You can join Case School of Engineering professors-turned-pioneers in cutting-edge research, using state-of-the-art technology. You work one-on-one with faculty members in micro-fuel cell development, diamond-making, and potential spinal cord prosthesis. In some cases, you earn academic credit for working with your professors on projects like these. You may also earn pay for your research.

Research with Faculty

- Paulo Meneghetti, a chemical engineering major, has worked with Professor Syed Qutubuddin on nonocomposites, a new kind of polymer-based composite with ultrafine phase dimensions
- Biomedical engineering major Corey Kemper has turned a summer research program with Professor David Wilson into her senior project. She developed a novel, interactive 3D warping image registration method that should improve the detection of and therapy for prostate cancer and is proving useful for quantitative studies of aerosol drug delivery

Research Centers

You can also choose among twelve interdisciplinary research centers, which act as intensive incubators for engineering research and study of real-world applications in many specialized areas. Through these centers you communicate directly with industries and gain research experience that strongly prepares you for advanced study. Centers include:

- Applied Neural Control Laboratory develops technology and devices to restore missing or impaired body functions and participates in transferring these findings to industry for commercialization
- Cardiac Bioelectricity Research and Training Center focuses on understanding the electrical activity and rhythm disorders of the heart in order to develop better diagnostic tools and approaches for prevention and treatment
- Center for Advanced Liquid Crystalline Optical Materials conducts research and educational programming in liquid crystal technology from kindergarten through postgraduate
- Center for Applied Polymer Research carries out research on polymer blends and alloys, structural composites, processing of layered materials and structures, polymers for biomedical applications, and new materials concepts and innovative analytical techniques for industrial partners
- Center for Automation and Intelligent Systems Research identifies ways to apply computer technology to industry and integrates computer hardware, software, electronic, sensor, and engineering technologies and conducts basic and applied research and development in machine control, process control, and intelligent systems
- Center for Cardiovascular Biomaterials integrates medical science with engineering concepts and applications to investigate biomaterials and devices for use as cardiovascular implants in patients
- Center for Surface Analysis of Materials provides a comprehensive solution to surface and near-surface microchemical analysis and microstructural characterization needs
- Center on Hierarchical Structures aims to understand how the unique performance of natural materials arises from precise hierarchical organization, to apply lessons from biology to the design of new hierarchical material systems, and to develop new processes for building complex hierarchical structures
- Electronic Design Center focuses on the advancement of the science and technology of sensor research and provides facilities and training for academic and industrial research
- Ernest B. Yeager Center for Electrochemical Sciences covers electrochemistry and the technologies derived from it
- National Center for Microgravity Research on Fluids and Combustion performs research in microgravity fluids and combustion sciences necessary to support the long-term human presence, development, and exploration of space as well as to enhance life on Earth
- Microelectromechanical Systems Research Program provides clean room space for bulk and surface micromachining and for integrated circuit fabrication

Experience the Difference

In CWRU's Case School of Engineering you discover a program that is setting the standards for engineering education—and student success. CWRU has made a difference in these and other students' lives, especially with experience-based learning. From the engineering co-op program to interdisciplinary research centers, experience the difference in your own education.



Student Success

- Niuniu Ji, a systems and control engineering major, has been awarded the highly prized Rhodes Scholarship, he will begin two-year studies at Oxford University in England to complete an honors B.A. in economics and management
- Chemical engineering major Patrick Coles is one of only a dozen students in the United States to win a Churchill Scholarship to study at Cambridge University in England

Life After CWRU

In addition to being among the top students in the country, you prepare for leadership in engineering professions in a variety of work environments. In fact, twenty-four percent of engineering alumni report holding leadership titles such as president, vice president, chairman, or CEO. Here are just a few success stories:

He Just Did It

Frank Rudy ('50), a mechanical engineering graduate, has more than 250 patents in the United States and thirty foreign countries—including the Nike Air-Sole. Rudy first used his expertise in engineering to design an air ski boot, then created the air-soled athletic shoe. The specially designed shoes are permanently pressurized with air, plus a small amount of a unique gas at about twenty-eight pounds per square inch, like the pressure in an automobile tire. It automatically adjusts and retains the correct cushioning properties and pressure for the life of the shoe. Rudy tried to sell his invention to twenty-three footwear companies worldwide before he inadvertently heard about the up-and-coming Nike Company. Rudy offered the president of Nike a "no-risk" deal. The shoe has since become a worldwide household name.

He Wants to Be a Millionaire

Alumnus Kevin Olmstead ('81) is no stranger to game shows. When he won \$2,180,000 on ABC's hit program "Who Wants to be a Millionaire," it was his second such victory. In 1994 he won almost \$27,000 when he appeared on "Jeopardy" for three days. His most recent win also helped him set the record for the most money won on a game show. Olmstead, who has a B.S. in chemical engineering from CWRU, is a project engineer for Tetra Tech MPS in Ann Arbor, Michigan. He is also the co-founder and CFO of National Academic Quiz Tournaments, a company that prepares and writes questions for contests geared to high school and college students. In his spare time he advises the University of Michigan's "quiz bowl" group. This experience has served him well as both a competitor and as an advisor. Olmstead coached the last person before him to win a million dollars on "Who Wants to be a Millionaire."

Other Case School of Engineering alumni:

- Paul Friedl ('55, GRS '57, '60) created "SCAMP" (Scientific Computer and Modulator Processor), IBM's first operating computer to use the concept of microprogram control
- Richard LeFauve ('56) has served as director of Harley-Davidson, senior vice president of General Motors Corporation, president of GM University, and chairman and president of Saturn Corporation

Engineering Degree Programs

The Case School of Engineering offers degree programs in thirteen areas of engineering, those that follow and an undesignated engineering degree in which you design your own course of study. All degree programs are accredited by the Accreditation Board for Engineering and Technology.

Majors include:

Aerospace Engineering
Biomedical Engineering
Chemical Engineering
Civil Engineering
Computer Engineering
Computer Science
Electrical Engineering
Engineering Physics

Fluid and Thermal Engineering
Materials Science and Engineering
Mechanical Engineering
Polymer Science and Engineering
Systems and Control Engineering

For more information:

Case School of Engineering
Glennan Building
Case Western Reserve University
10900 Euclid Avenue
Cleveland, OH 44106-7220
(216)368-4436
Email: cseacad@po.cwru.edu
<http://www.case.cwru.edu>

or

Office of Undergraduate Admission
103 Tomlinson Hall
Case Western Reserve University
10900 Euclid Avenue
Cleveland, OH 44106-7055
(216)368-4450

Email: admission@po.cwru.edu

<http://www.cwru.edu/provost/ugadmiss/ugadmiss.html>

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10900 Euclid Avenue

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