Electrical Engineering, BS

Department: Electrical and Computer Engineering Department
College: College of Engineering

Overview

About This Degree

The Electrical and Computer Engineering Department is listed in the top 100 college departments according to *U.S. News & World Report*. Students graduate with nearly 100% job placement and have among the highest starting salaries of all degree programs.

Electrical engineers work with electronics, electricity, and electromagnetism, and electronic devices. Electrical engineering covers a broad range of application areas, including power generation and delivery, transportation (cars and airplanes), communication (radio, TV, wireless, telephones), robotics, computers (memory systems, displays, microprocessors), defense applications (navigation, radar, and secure communication), and consumer electronics (DVD and MP3 players).

Electrical engineering and computer engineering are similar, as both build on the same technical foundation. They differ in that electrical engineering is a broader degree, with additional background provided in areas such as electronics, controls, electromagnetics, and signal processing. Computer engineering has a deeper focus on computers and software, including computer architecture, networking, operating systems, and algorithms.

The electrical engineering degree is accredited by the EAC Accreditation Commission of ABET.

Concurrent Bachelor's/Master's Program:

The department also offers a concurrent bachelor's/master's program, which allows USU engineering students to begin taking graduate classes during their senior year as an undergraduate and to complete requirements for both the bachelor's degree and the master's degree concurrently over two years.

Career Options

Since nearly everyone uses electricity and electrical devices, graduates in electrical engineering can work in almost any kind of industry. Electrical engineers develop anything from rockets, cell phones, computers, antennas, signal towers, robotics, and more. The following are examples of areas in which electrical engineers can work:

- Scientific research and development firms
- Electrical component manufacturing companies
- Power generation, distribution, and transmission
- Manufacturers of navigation controls, medical equipment, and measurement devices
- Architectural firms

Career Services provides counseling and information on hundreds of job and internship opportunities and even helps students apply and interview.

What it takes

Admissions Requirements

In addition to Utah State University's admissions requirements, the electrical engineering program has additional requirements:

- **Freshmen:** Students that meet the USU admission requirements can be admitted as pre-engineering majors. In order to get into the professional engineering program, students must complete two years of prerequisite coursework, have a C- or better in every required class, no more than three classes repeated, and entrance GPA of 2.8 or above. To be accepted to the electrical engineering pre-major, students must meet certain math requirements by completing one of the following: a score of 27 or higher on the math ACT, a grade of B or better in MATH 1050 and MATH 1060 *or* MATH 1210, or a score of 3 or higher on the AB or BC AP calculus test.
- **Transfer Students:** Students transferring from other institutions will be referred to the Engineering Admission Committee for evaluation. Evaluations will include transfer GPA and evaluation of the program of

the former college or university. Students transferring from other USU majors must be approved by the Engineering Admission Committee before transferring to the College of Engineering. Students in this category must have demonstrated a potential to succeed in engineering through courses taken at USU.
- Recommended high school courses: two or three years of algebra, one year of geometry, one-half year of trigonometry, four years of English, and courses in computer programming, chemistry, and physics are preferred.

International students have additional admissions requirements.

Major Requirements

Click here to see course requirements for the **Bachelor of Science**.

Students majoring in electrical engineering must complete a capstone design project during their senior year.

Contact

Advising

All new USU students participate in a New Student Orientation program, where they receive detailed information about major requirements, registering for classes, and other important advising information.

Isobel Roskelley
Advisor
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Get Involved

Professional Organizations, Honor Societies, and Clubs

American Council of Engineering Companies: ACEC is the voice of America's engineering industry. Council members, numbering more than 5,300 firms throughout the country, are engaged in a wide range of engineering works that propel the nation's economy and enhance and safeguard America's quality of life. The council's mission is to contribute to America's prosperity and welfare by advancing the business interests of member firms.

Engineers without Borders: The USU chapter of Engineers without Borders is a nonprofit organization. Contributions help the organization build projects that developing communities will own and operate. EWB works with communities worldwide to improve the quality of life by promoting sustainable development in water supply, housing construction, food production, energy, sanitation, transportation, communication, and employment. EWB's vision is a world where all people have the knowledge and resources needed to meet basic human needs. It involves international professionals and students inall fields as they build this vision together.

National Engineers Week Foundation: This foundation strives to be the global leader in cultivating and celebrating the engineering profession. Its cornerstone program is Engineers Week. All programs are designed to reach out to current and future generations of engineering talent.

Utah Engineers Council: The UEC is an umbrella organization of 14 different local chapters and sections of engineering societies. The purpose of the UEC is to advance the art and science of engineering and to provide a forum for communication between the varying engineering societies.

Engineering Student Council: The Engineering Council is an organization of engineering students. The council provides students with the opportunity to communicate opinions and suggestions to the College of Engineering administration, university administration, and the Associated Students of Utah State University. The Engineering Student Council represents students who are in the College of Engineering, communicates with engineering students about concerns, and publicizes programs and activities.

Future Association of Tomorrow's Engineers: FATE is the USU regional campus engineering club. It aims to promote and support engineering throughout the USU regional campus system via social networking, community outreach, recruitment, and fun (possibly geeky) activities.

Institute of Electrical and Electronics Engineers Student Chapter: IEEE is the world's largest professional

association dedicated to advancing technological innovation and excellence for the benefit of humanity. IEEE and its members inspire a global community through IEEE's highly cited publications, conferences, technology standards, and professional and educational activities.

National Society of Black Engineers Student Chapter: NSBE has more than 35,700 members and is one of the largest student-governed organizations in the country. Founded in 1975, NSBE now includes more than 450 colleges, pre-college, and technical professional/alumni chapters in the United States and abroad. NSBE's mission is to increase the number of culturally responsible black engineers who excel academically, succeed professionally, and positively impact the community. NSBE offers its members leadership training, professional development, mentoring opportunities, career placement services, and more.

Society of Hispanic Professional Engineers Student Chapter: SHPE is a national organization that aims to build unity through diversity of engineering students. The club holds fund-raising and service activities, participates in engineering-related campus wide activities and competitions, and hosts activities with local middle and high school students aimed at science and technology. The national organization holds an annual conference, which is the major event and the largest technical and career conference for Hispanics in the country. The conference is an opportunity for engineering companies and corporations to recruit top talent from SHPE.

Society of Women Engineers: Utah State University's Society of Women Engineers is open for both male and female members. SWE is committed to encouraging women engineers to attain high levels of educational and professional achievement, serve as a center of information for women in engineering, and promote the value of diversity.

Tau Beta Pi Honor Society: Tau Beta Pi is the only engineering honor society representing the entire engineering profession. It is the nation's second-oldest honor society. It marks, in a fitting manner, those who have conferred honor upon their alma mater by distinguished scholarship and exemplary character as students in engineering, or by their attainments as alumni in the field of engineering. There are now collegiate chapters at 236 U.S. colleges and universities, active alumnus chapters in 16 districts across the country, and a total initiated membership of more than 500,000.

Labs, Centers, Research

With the second oldest undergraduate research program in the nation, USU offers students a wide range of opportunities to gain hands-on research experience. The Undergraduate Research and Creative Opportunities program allows students to apply for grants and receive funding. USU's Honors Program prepares students for excellent graduate programs by helping them build relationships with professors, participate in research projects, take smaller, more intensive classes, and develop leadership skills.

AggieAir Flying Circus: AggieAir Flying Circus provides high-resolution, multispectral aerial imagery using a small, unmanned aerial system. The system is able to map small areas quicker, more frequently, at greater resolution, and at a smaller cost than conventional remote sensing. Some applications for AggieAir include monitoring of soil moisture and evapotranspiration in agriculture, riparian habitat mapping, road and highway surface monitoring, wetland mapping, and fish and wildlife tracking.

Anderson Center for Wireless Teaching and Research: This center provides state-of-the art wireless communication teaching and research with emphasis on industry-relevant design projects.

Center for Active Sensing and Imaging: CASI uses radar-like, laser-based LIDAR technology to measure distances instead of radio waves for a variety of industrial applications, including sitting wind farms, controlling emissions, and rapid replacement of bridges, runways, and other infrastructure.

Center for Atmospheric and Space Sciences: CASS is recognized nationally and internationally as a progressive research center with advanced space and upper atmospheric research programs. CASS scientists are tackling the adverse consequences of space weather. Undergraduate and graduate students are involved in numerous research projects in CASS that provide opportunities to program computers, analyze data, and build instrumentation.

Center for High Performance Computing: HPC at USU is a research service center that serves and expands the computational needs of the USU community. HPC at USU houses a 256-processor cluster called "Uinta," with three networks.

Center for Self-Organizing and Intelligent Systems: CSOIS is a multi-disciplinary research group at USU that focuses on the design, development, and implementation of intelligent, autonomous mechatronic systems, with a

focus on ground vehicles and robotics.

Center for Space Engineering: CSE is a multi-disciplinary group of faculty at USU involved in space technology, systems, and science. The center brings together academics, industry, and government to advance the understanding of the space environment and to train the next generation.

Energy Dynamics Laboratory: EDL bridges the gap between academia and industry, confronting the challenges of prototyping, deployment, and commercialization of enabling technologies for renewable and advanced energy systems. USU researchers originate projects to derive energy from non-fossil fuels, such as biofuels, wind, and solar power. With EDL's collaboration, research develops through pilot projects to commercial application.

Energy Laboratory: This lab seeks to develop solutions to America's most intractable energy problems through scientific and technological innovation. It provides a cohesive framework permitting faculty, students, and partnering institutions to focus on contemporary energy-related research issues.

Environmental Management Research Group: EMRG is a research unit of the Utah Water Research Laboratory focused on integrated watershed management and systems analysis of environmental problems. EMRG provides software development, watershed and water quality modeling, and GIS data analysis service to internal and external entities directed at solving integrated watershed and environmental management-related problems of a variety of scales.

Institute for Intuitive Buildings: Because a considerable amount of energy is wasted in lighting, cooling, and ventilating commercial buildings, the I2B team will create real-time scene measurement and interpretation techniques for electric lighting systems.

Rocky Mountain NASA Space Grant Consortium: RMNSGC is one of 52 National Space Grant Consortia in the United States. As a member of the consortium, USU has awarded more than 100 fellowships to students interested in aerospace-related education and careers. The majority of Space Grant student awards include a mentored research experience with university faculty and NASA scientists, engineers, and technologists.

Space Dynamics Laboratory: SDL is known for sending 500+ successful experiments into space and brings in $54 million per year in revenue, the majority coming from grants, contracts, and appropriations. SDL's expertise in the development of sensors and calibration, small satellites and real-time intelligence has made it an internationally known organization in the space arena.

Synthetic Biomanufacturing Center: SBC uses the chemical makeup present in single-cell organisms to transform raw materials into environmentally friendly products, such as low-cost bioplastics, biodiesel, light energy, and pharmaceuticals.

Utah Transportation Center: The UTC uses its expertise in natural hazards to research congestion chokepoints, evacuation occurrences, infrastructure renewal, and operations as it relates to multi-modal transportation.