Civil Engineering, BS, APE

Department: Civil and Environmental Engineering Department
College: College of Engineering

Overview

About This Degree

Civil engineers plan, design, construct, and maintain public works, such as roads, bridges, and harbors. While they focus on building, they also look at the environmental impact of the structure and the structure's stability in the case of environmental hazards, such as earthquakes and hurricanes.

The coursework in the department covers five different areas: environmental engineering, fluid mechanics and hydraulics, geotechnical engineering, transportation engineering, and water resources engineering. Students must gain proficiency in at least two of these areas. As they prepare for careers as civil engineers, students will learn how to do the following types of things:

- Design or supervise the construction of bridges, buildings, dams, aqueducts, sport complexes, energy complexes, irrigation and transportation systems (such as highways, canals, rapid transit lines, etc.), and more
- Develop water resources for municipal, industrial, and recreational use
- Participate in land reclamation, soil mechanics, and urban planning
- Maintain water quality through water purification and proper waste treatment
- Solve problems involving air pollution and solid and hazardous waste management

The civil engineering degree is accredited by the EAC Accreditation Commission of ABET. The job placement rate for students graduating from USU's engineering programs is extremely high.

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.

The **APE** is designed to meet the qualifications of the first two years of a Baccalaureate Degree.

Career Options

With a degree in civil engineering, students can work in the following areas:

- Construction site or city supervisor/administrator
- Consultant (designs and plan projects)
- Public service manager (organize and maintain the construction of roads, bridges, tunnels etc.)
- Engineering technician (focus on basic engineering principles and technical skills)
- Air pollution control
- Industrial hygiene
- Waste disposal and recycling
- Radiation protection
- Hazardous waste management
- Toxic materials control
- Wastewater management
- Storm water management
- Solid waste disposal
- Public health
- Land management

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 civil 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 2.3 or above.
- **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 chemistry, physics (especially AP physics), and mechanical drawing are preferred.

International students have additional admissions requirements.

Major Requirements

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

Click here to see course requirements for the **Associate of Science in Pre-Engineering**.

Students will be required to purchase and use an HP calculator.

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

Passing the Fundamentals of Engineering examination, which is the first step in becoming a licensed professional engineer, is desired for graduation.

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.

Kathy Bayn
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Get Involved

Professional Organizations, Honor Societies, and Clubs

Air and Waste Management Association: AWMA is a nonprofit, nonpartisan professional organization that enhances knowledge and expertise by providing a neutral forum for information exchange, professional development, networking opportunities, public education, and outreach. Its mission is to promote global environmental responsibility through education.

American Council of Engineering Companies: ACEC is the voice of America's engineering industry. Council members 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.

American Society of Agricultural and Biological Engineers: This is a professional society of people interested in the engineering approach to food, agriculture, and biological concerns. ASABE seeks methods for the development of producing food and renewable resources.

American Society of Civil Engineers: ASCE is a professional organization representing members of the civil engineering profession worldwide. It is the oldest national engineering society in the United States. ASCE's vision is to have engineers positioned as global leaders who strive toward building a better quality of life.

American Society for Photogrammetry and Remote Sensing: ASPRS is a scientific association whose mission is to advance knowledge and improve understanding of mapping sciences to promote the responsible applications of photogrammetry, remote sensing, geographic information systems, and supporting technologies.

American Water Resources Association: The American Water Resources Association is a nonprofit professional association dedicated to the advancement of people in water resources management, research, and education. AWRA's membership is multidisciplinary; its diversity is its hallmark. It is the professional home of a wide variety of water resources experts, including engineers, educators, foresters, biologists, ecologists, geographers, managers, regulators, hydrologists, and attorneys.

American Water Works Association: AWWA is the authoritative resource on safe water. Its worldwide membership shares knowledge on water resource development, water and wastewater treatment technology, water storage and distribution, and utility management and operations.

Earthquake Engineering Research Institute: EERI is a national, nonprofit, technical society of engineers, geoscientists, architects, planners, public officials, and social scientists. EERI members include researchers, practicing professionals, educators, government officials, and building code regulators. The objective of the Earthquake Engineering Research Institute is to reduce earthquake risk by advancing the science and practice of earthquake engineering; improving understanding of the impact of earthquakes on the physical, social, economic, political, and cultural environment; and advocating comprehensive and realistic measures for reducing the harmful effects of earthquakes.

Engineers Without Borders: The purpose of the student chapter of Engineers Without Borders at USU is to identify and solve engineering and humanitarian problems for impoverished orphanages and communities. The principal activities include providing clean water and solar power, improving sanitary conditions, enhancing educational programs, improving classroom structures, and assisting with other tasks requested by the local people.

Institute of Transportation Engineers: ITE, an international educational and scientific association, is one of the largest and fastest-growing professional transportation organizations in the world. ITE members include traffic engineers, transportation planners, and other professionals who are responsible for meeting society's needs for safe and efficient surface transportation.

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.

Structural Engineers Association of Utah: SEAU is an organization for structural engineers across the state. SEAU's aims are to increase acquaintance and understanding among structural engineers, advance technical expertise and high standards in the profession, promote legislation and codes, and increase public awareness of structural engineering.

Utah Engineers Council: The UEC is an umbrella organization of 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.

Water Environment Association of Utah: WEAU is the state of Utah affiliate of the Water Environment Federation. It is a member association comprised of water quality professionals, including public works staff, treatment plant operators, engineers, scientists, and planners working to preserve and enhance water quality and the global water environment.

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 activities.

National Society of Black Engineers Student Chapter: NSBE is one of the largest student-governed organizations in the country. 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.

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: This is the only engineering honor society representing the entire engineering profession. It is the nation's second-oldest honor society, founded at Lehigh University in 1885 to recognize those exhibiting

distinguished scholarship and exemplary character as students in engineering, or by their attainments as alumni in the field of engineering, and to foster a spirit of liberal culture in engineering colleges.

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.

Buried Structures Laboratory: The Buried Structures Laboratory conducts research into the performance of buried pipes. The lab has performed research on both flexible and rigid pipes.

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.

Environmental Quality Laboratory: The EQL is located at the Utah Water Research Lab and is equipped for analyses of organic and inorganic constituents in air, water, and soil. The EQL consists of chemistry, microbiology, radiological and analytical instrumentation laboratories, two constant-temperature rooms, and research project areas.

Hydraulics Laboratory: The Hydraulics Lab at the Utah Water Research Laboratory contains a variety of flumes, channels, pumps, pipelines, equipment, and instrumentation for conducting hydraulic research, model studies, valve testing, and flow-meter calibrations.

Institute for Dam Safety Risk Management: The IDSRM conducts research to advance the state of practice in risk-informed approaches to dam safety management. Approaches developed by the institute are now used by engineers, private and government dam owners, and regulators in many countries. These approaches help improve the understanding and management of the risks associated with owning and operating dams, with the goal of improving public safety, reducing economic, environmental, and societal risks, and reducing the owner's liability.

Institute for Natural Systems Engineering: The INSE is a recognized leader in the development, testing, and application of multi-disciplinary assessment methods for aquatic ecosystems and instream flow assessment methodologies.

International Irrigation Center: The IIC was established in a response to an increasing need for providing training and research to enhance the capabilities of professionals and scientists outside the United States for improving irrigated agriculture in their countries.

Utah Botanical Center: The UBC, located in Kaysville, Utah, is home to research and demonstration projects focused

on sustainable living in the Intermountain West. Studies of water conservation, horticulture, water quality enhancement, wetland ecology, integrated pest management, urban forestry, agriculture, fish and wildlife, highway enhancement, and storm-water management combine to make the center a living laboratory.

Utah Center for Water Resources Research: The UCWRR facilitates water research, outreach, design, and testing elements within a university environment that supports student education and citizen training.

Utah Local Technical Assistance Program: LTAP specializes in projects such as road-surface management, asset management, traffic operations, highway safety, innovative contracting, infrastructure management, and other transportation challenges.

Utah On-Site Wastewater Training Center: This center provides education, training, and technology transfer to installers, inspectors, regulators, and homeowners within the Rocky Mountain Region on the proper design and use of wastewater treatment systems.

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.

Utah Water Research Laboratory: The UWRL works on nearly 250 water-related projects a year and has projects in all of Utah's 29 counties and more than 40 countries. The lab is one of the go-to places that addresses the technical and societal aspects of water-related issues, including quality, quantity, and distribution of water.

Water Initiative: Utah State University supports a broad community of students and faculty engaged in water education, research, and outreach. The USU Water Initiative provides an overarching umbrella for the activities of this community aimed at fostering interdisciplinary collaboration and collegial sharing of ideas related to water across the departments and colleges of USU.