McCormick

Northwestern Engineering

Civil and Environmental Engineering

Undergraduate Civil Engineering

Profession

Civil Engineering is an international profession that provides solutions for pressing societal challenges for both the natural and built environment as shown in the video, linked from our web site. Civilian infrastructure systems provide safe drinking water, sustainable energy, efficient mobility, and sequestered or treated waste. They transform wastelands and protect against natural disasters. Civil engineers design, construct, and manage these systems as well as the taller, longer, lighter, and more elegant structures at the ends nodes, such as airports, sky scrapers, bridges, etc. everywhere on the planet. Each system has unique characteristics that challenge civil engineers to combine engineering knowledge with initiative and creativity to satisfy project objectives, protect the well-being of society and our finite natural resources, and meet budget constraints.

Civil Engineers must employ the social, economic, managerial sciences, and collaborate with other experts and the public. Their work may extend to biotechnology to support environmental restoration, and to materials science to develop new building materials. Civil engineers use advanced sensors and communication devices to monitor performance of bridges, tunnels, buildings in real time, over long distances, and under extreme conditions. In addition, students at Northwestern learn to apply and develop computer models and analytical and experimental methods to explore the response of infrastructure systems to normal and extreme stresses in advance of construction.

Civil Engineering bridges science and society, and thus plays a leading role in planning, designing, building, and ensuring a sustainable future. The American Society of Civil Engineers (ASCE) defines sustainability as a set of economic, environmental and social conditions in which all of society has the capacity and opportunity to maintain and improve its quality of life indefinitely, without degrading the quantity, quality or the availability of natural resources and ecosystems. The civil engineering profession recognizes the reality of limited natural resources, the desire for sustainable practice (including life-cycle analysis and sustainable design techniques), and the need for social equity in the consumption of resources.

At Northwestern, the Civil Engineering curriculum has been designed to satisfy diverse interests and professional goals. Students develop study plans suited to their unique interests, including extensive options for courses outside the McCormick School to address the social, physical, and financial challenges of constructing and managing the nation's infrastructure.

While Civil engineering graduates typically work in consulting firms, city and county public works, state departments of transportation, construction companies, various branches of federal government, and concrete and steel product industries, some of our graduates work in the aerospace industry, Wall Street, medicine, laws, politics, and policy development. A majority of Northwestern graduates receive at least one advanced degree. About half of these received advanced degrees are in other technical fields such as aerospace, business administration, medicine, and law. Others may work in research and development, and teaching.

Employment

Our recent graduates hold jobs in a wide spectrum of areas such as infrastructure engineering consulting (buildings, bridges, railroads, power plants, water and wastewater treatment plants, etc.), construction, project management, architecture, energy, and finance. Their positions include project engineers, project managers, field engineers, and designers. Some graduates join the business sector as business analysts, technical consultants, and derivative traders. Their employers include Amazon, Boeing, Accenture, ARCADIS, Mass Electric Construction, General Dynamics' Electric Boat Division, and National Forest Service. Others went directly to graduate school. Most mid-career civil engineers hold supervisory or administrative positions such as project engineers.

According to the U.S. Bureau of Labor Statistics (http://www.bls.gov/oes/current/oes172051.htm), civil engineers held about 258,100 jobs in 2012. About 50% were employed by firms providing engineering design, consulting and architectural services. Another 30% of the positions were in federal, state, and local government agencies. Construction, utility, transportation, and manufacturing industries accounted for most of the remaining employment.

Job Outlook

According to the U.S. Bureau of Labor Statistics[1], employment of civil engineers was expected to increase 19%, faster than the average for all occupations (14%), and almost double of the average of all engineers (11%), through 2020. The largest increase was projected in the consulting services (35%) followed by construction (25%). As infrastructure continues to age, civil engineers will be needed to manage projects to rebuild bridges, repair roads, upgrade levees, dams, etc. A growing population requires that water supply and waste treatment systems must not only be maintained but enlarged to maintain the present quality of life. Civil engineers must accomplish this while protecting and preserving our natural environment.

Earnings

The 2013 salary survey conducted by the American Society of Civil Engineers (ASCE), tabulated below, reveals that the total compensation for civil engineers with different levels of experience begins in the $50,000 range and will initially increase some 7 to 8% per year and then accelerate.

Experience	Average	10th percentile	25th percentile	Median	75th percentile	90th percentile
0+ years	$52,015	$40,000	$46,000	$52,000	$56,000	$67,000
1+ years	$54,750	$44,000	$49,000	$55,000	$60,000	$69,000
3+ years	$59,055	$46,300	$51,539	$57,000	$64,740	$80,500
4+ years	$71,176	$54,600	$61,000	$69,500	$78,000	$98,280
8+ years	$85,291	$63,323	$72,000	$82,356	$95,238	$121,864
10+ years	$102,072	$71,240	$85,000	$101,000	$118,327	$146,848
15+ years	$114,854	$78,500	$90,000	$109,750	$132,000	$182,500
25+ years	$134,921	$85,000	$105,000	$136,000	$159,970	$208,000

[1] 2012-2013 Occupational Outlook Handbook (http://www.bls.gov/ooh/architecture-and-engineering/civil-engineers.htm)