

ENGINEER

Job Description: Nearly all large-scale energy development requires engineering services, sometimes in multiple disciplines. There are several different types of engineers involved in energy development, including agricultural, civil, electrical, environmental, industrial, mechanical, and petroleum. It is the job of an engineer to research, design, plan and perform accurate and highly technical engineering duties for the clients they serve. Below is a sampling of core tasks by engineering discipline:



- Design agricultural machinery components and equipment using computer-aided design (CAD) technology (Agricultural)
- Test soils and materials to determine the adequacy and strength of foundations, concrete, asphalt, or steel (Civil)
- Design, implement, maintain, or improve electrical instruments, equipment, facilities, components, and systems for commercial, industrial, or domestic purposes (Electrical)
- Design or supervise the design of systems, processes, or equipment for the control and management of water, air or soil quality (Environmental)
- Estimate production costs, cost saving methods, and the effects of product design changes on expenditures for management review and action (Industrial)
- Research, design, evaluate, install, operate, and maintain mechanical products, equipment, systems and processes to meet requirements (Mechanical)
- Design and develop methods for extracting oil and gas from deposits below the earth's surface; and find new ways to extract oil and gas from older wells (Petroleum)

Needed Skills and Education: A bachelor's degree in engineering is usually required for entry-level engineering jobs. Some colleges offer two- or four-year degrees in engineering technology. These programs prepare students for practical design and production work, but additional scientific and mathematical knowledge is needed to reach the level of engineer. Employers value practical experience, and getting a license improves the chances for employment. Important skills include complex problem solving, instructing, judgment and decision-making, systems analysis, and time management. An engineer has to have high levels of skill in many areas including: analyzing and testing engineering plans, investigating data to solve problems, operating computers to create engineering designs, preparing technical or research reports, etc.

Wages: Engineering wages vary by specialty. In nearly all cases however, the average annual wage in North Dakota is in the high \$60,000 to mid-\$70,000 range, with Petroleum engineers earning significantly higher. The employment outlook for this career in North Dakota and nationally is stable to growing, with civil, industrial, mechanical, and petroleum engineering showing the highest levels of growth.

Other information: All 50 states register engineers. Registration generally requires a degree from an accredited engineering program, four years of relevant work experience and successful completion of a state exam. Advanced degrees in engineering lead to improved job opportunities and higher wages.

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