

Occupational Profile

Electrical Engineers

SKILLS YOU NEED

Basic Skills:

- Reading Comprehension
- Active Listening
- Writing
- Speaking
- Mathematics
- Science
- Critical Thinking
- Active Learning
- Learning Strategies
- Monitoring

Transferable Skills (applicable in other careers):

High level

- Analyzing and testing engineering plans
- Creating design concepts for machines and equipment
- Creating engineering concepts
- Designing machinery, equipment, and products
- Directing an engineering design team
- Explaining electrical/electronic operations and problems
- Observing and diagnosing electrical/electronic problems
- Operating computers to create engineering designs
- Operating computers to record and analyze engineering data

Workplace Skills:

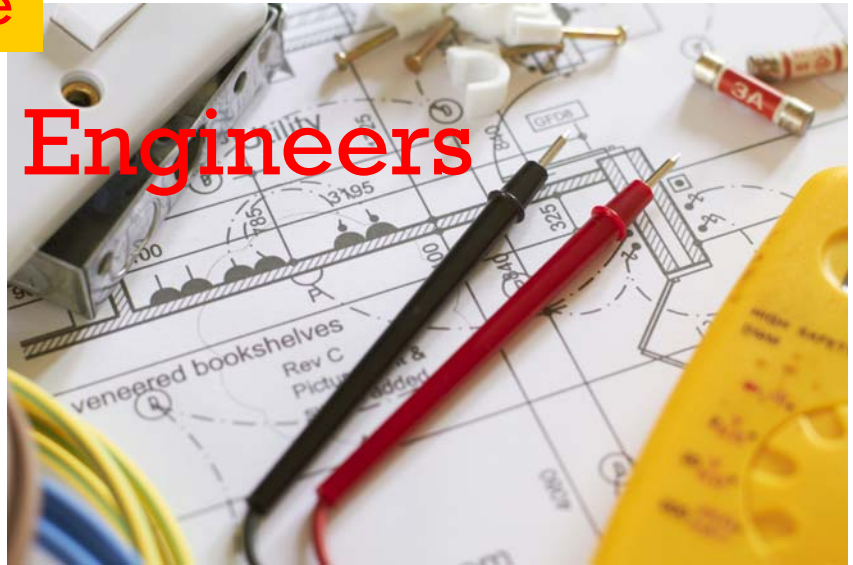
High level

- Complex Problem Solving
- Coordination
- Equipment Selection
- Judgment and Decision Making
- Systems Analysis
- Systems Evaluation
- Technology Design
- Time Management
- Troubleshooting

Medium level

- Installation
- Management of Financial Resources
- Management of Material Resources
- Management of Personnel Resources
- Operation and Control
- Operations Analysis
- Quality Control Analysis
- Service Orientation

Additional skills for this occupation may be found at <http://www.iowaworkforce.org/pubs/careers/cps> .



WHAT THEY DO

Designs, develops, tests or supervises the manufacturing and installation of electrical equipment, components or systems for commercial, industrial, military or scientific use. Belongs to the Science, Technology, Engineering and Mathematics cluster and Engineering and Technology pathway.

IS THIS FOR YOU?

Work Interests are described in the following categories (compatible with Holland's Model) by people who tend to succeed in this career:

- **Conventional** – You are an "organizer". Keeping things neat and organized is important to you. You like working with charts and reports, and work well with power and authority.
- **Investigative** – You are a "thinker". When you have a problem, you like to analyze it and look at different ways to solve it. You like to work by yourself, and you don't like explaining your ideas to other people.
- **Realistic** – You are a "doer". You like physical activities and projects. You like to find the answers to problems by doing hands-on work instead of talking about solutions.

Work Values are aspects of work that are satisfying to you. The following work values are generally associated with this career.

- **Achievement** – It's very important to you that your work allows you to use your best abilities. You want to see the results of your work and get a feeling of accomplishment.
- **Independence** – It's very important to you that your work allows you to make decisions on your own. You want to try out your own ideas and work with little supervision.

Aptitudes reflect a person's ability to acquire skills and knowledge. The following aptitudes are important for success in the career:

- **General Learning Ability**
- **Verbal Aptitude**
- **Numerical Aptitude**
- **Spatial Perception**

Source: <https://secure.ihaveaplaniowa.gov/>

ESTIMATED & PROJECTED EMPLOYMENT

Occupational Title	2010 Estimated Employment	2020 Projected Employment	2010-20 Employment Change	Annual Growth Rate (%)	Total Annual Openings
Total All Occupations	1,717,020	1,948,700	231,680	1.3	64,525
Architecture & Engineering Occupations	17,940	20,570	2,630	1.5	670
Electrical Engineers	1,255	1,325	70	0.6	35

Source: <http://iwin.iwd.state.ia.us/pubs/statewide/stateoccproj.pdf>

2012 WAGE & SALARY (\$)

Occupational Title	Average Wage	Average Salary	Entry Wage	Entry Salary	Experienced Wage	Experienced Salary
Total All Occupations	18.90	39,295	9.30	19,341	23.69	49,272
Architecture & Engineering Occupations	31.94	66,438	20.55	42,746	37.63	78,284
Electrical Engineers	37.82	78,668	27.41	57,016	43.02	89,493

Source: <http://iwin.iwd.state.ia.us/pubs/statewide/stateoccproj.pdf>

EDUCATION & TRAINING

Education	Work Experience	Job Training
Bachelor's Degree	None	None

A bachelor's degree in engineering is required for almost all entry-level engineering jobs. College graduates with a degree in a natural science or mathematics occasionally may qualify for some engineering jobs, especially in specialties in high demand. Graduate training is essential for engineering faculty positions and many research and development programs, but is not required for the majority of entry-level engineering jobs. All 50 states and the District of Columbia require licensure for engineers who offer their services directly to the public. Engineers who are licensed are called professional engineers (PE). This licensure generally requires a degree from an Accreditation Board for Engineering and Technology (ABET) engineering program, four years of relevant work experience, and successful completion of a state examination. Iowa's Engineering and Land Surveying Examining Board at http://access.bridges.com/ext/cp/custom_state_data/iowa_licensed_occupations/17-2021.htm provides additional information.

Source: <http://iwin.iwd.state.ia.us/pubs/statewide/stateoccproj.pdf> and <https://secure.ihaveaplaniowa.gov/>

NATIONAL CAREER READINESS CERTIFICATE (NCRC)

Skill	Median Skill Level
Applied Mathematics	4
Locating Information	4
Reading for Information	5



This ACT-developed credential demonstrates achievement and a certain level of workplace employability skills. The greater the score, the greater the skill level (Bronze = 3, Silver = 4, Gold = 5, Platinum = 6).

Source: <http://www.act.org/workkeys/analysis/occup.html>

PRIMARY INDUSTRY SECTORS

(Where are Electrical Engineers Employed?)

Computer and Electronic Product Mfg
 Professional, Scientific, & Technical
 Utilities
 Machinery Mfg
 Electrical Equipment, Appliance, & Component Mfg
 Food Mfg

Source: <http://iwin.iwd.state.ia.us/pubs/statewide/stateoccproj.pdf>

ADDITIONAL SOURCES:

This publication was produced by the Labor Market and Workforce Information Division of Iowa Workforce Development. Revisions and/or corrections made when necessary. Inquiries may be directed to Brent Paulson at 515.281.3439 or Brent.Paulson@iwd.iowa.gov. Visit <http://iwin.iowaworkforce.org/> to obtain the latest workforce data and trends including this document under the **Publications** tab. Published 10/2013.