



# Industrial Engineers

## Occupational Profile

### 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.
- **Enterprising** – You are a "persuader". You like to sell things or ideas. Prestige and power are important to you. You like to use your language skills to convince other people of your ideas.

**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**

### WHAT THEY DO

Designs, develops, tests and evaluates integrated systems for managing industrial production processes including human work factors; quality control; inventory control; logistics and material flow; cost analysis; and production coordination. Belongs to the Science, Technology, Engineering and Mathematics cluster and Engineering and Technology pathway.

### SKILLS YOU NEED

#### Basic Skills:

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

#### Transferable Skills (applicable in other careers):

##### High level

- Analyzing and testing engineering plans
- Creating design concepts for products and processes
  - Creating engineering concepts
  - Designing systems
  - Directing an engineering design team
- Researching business problems to develop solutions
- Operating computers to create engineering designs
- Operating computers to record and analyze engineering data

#### Workplace Skills:

##### High level

- Equipment Selection

##### Medium level

- Complex Problem Solving
  - Coordination
  - Instructing
- Judgment and Decision Making
  - Negotiation
  - Persuasion
- Time Management
- Troubleshooting

Additional skills for this occupation may be found at <http://www.iowaworkforcedevelopment.gov/career-exploration-resources>

## ESTIMATED & PROJECTED EMPLOYMENT

| Occupational Title                     | 2012<br>Estimated<br>Employment | 2022<br>Projected<br>Employment | 2012-22<br>Employment<br>Change | Annual<br>Growth<br>Rate (%) | Total<br>Annual<br>Openings |
|--|---------------------------------|---------------------------------|---------------------------------|------------------------------|-----------------------------|
| Total, All Occupations                 | 1,758,205                       | 1,955,480                       | 197,275                         | 1.1                          | 61,665                      |
| Architecture & Engineering Occupations | 18,715                          | 20,165                          | 1,450                           | 0.8                          | 590                         |
| Industrial Engineers                   | 2,330                           | 2,500                           | 170                             | 0.7                          | 85                          |

Source: <http://www.iowaworkforcedevelopment.gov/occupational-projections-0>

## 2015 WAGE & SALARY (\$)

| Occupational Title                     | Average<br>Wage | Average<br>Salary | Entry<br>Wage | Entry<br>Salary | Experienced<br>Wage | Experienced<br>Salary |
|--|-----------------|-------------------|---------------|-----------------|---------------------|-----------------------|
| Total, All Occupations                 | 19.77           | 41,122            | 9.55          | 19,858          | 24.88               | 51,755                |
| Architecture & Engineering Occupations | 32.37           | 67,338            | 20.81         | 43,279          | 38.16               | 79,368                |
| Industrial Engineers                   | 35.13           | 73,073            | 26.41         | 54,931          | 39.49               | 82,144                |

Source: <http://www.iowaworkforcedevelopment.gov/occupational-projections-0>

## 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](http://access.bridges.com/ext/cp/custom_state_data/iowa_licensed_occupations/17-2021.htm) provides additional information. Source: <http://www.iowaworkforcedevelopment.gov/occupational-projections-0> and <https://secure.ihaveaplaniowa.gov/>

## NATIONAL CAREER READINESS CERTIFICATE (NCRC)

| Skill                   | Median Skill Level |
|-------------------------|--------------------|
| Applied Mathematics     | 5                  |
| Locating Information    | 5                  |
| 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 Industrial Engineers Employed?)

Machinery Mfg  
 Transportation Equipment Mfg  
 Fabricated Metal Product Mfg  
 Food Mfg  
 Computer and Electronic Product Mfg  
 Merchant Wholesalers  
 Electrical Equipment, Appliance, & Component Mfg  
 Furniture Mfg  
 Nonmetallic Mineral Product mfg  
 Wood Product Mfg

Source: <http://www.iowaworkforcedevelopment.gov/occupational-projections-0>



## ADDITIONAL SOURCES:

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