



**PLTW Engineering**

**12/Career Exploration – Industrial  
Engineer**

**May 1, 2020**



12/EDD

Lesson: 5/1/2020

**Objective/Learning Target: Students will be able to explain the career path of an Industrial engineer**



## What do industrial engineers do?

Industrial engineers find ways to eliminate wastefulness in production processes.

They devise efficient ways to use workers, machines, materials, information, and energy to make a product or provide a service.



## Typical duties for an Industrial Engineer

- Review production schedules, engineering specifications, process flows, and other information to understand methods and activities in manufacturing and services
- Figure out how to manufacture parts or products, or deliver services, with maximum efficiency
- Develop management control systems to make financial planning and cost analysis more efficient
- Enact quality control procedures to resolve production problems or minimize costs



## Typical duties for an Industrial Engineer

- Work with customers and management to develop standards for design and production
- Design control systems to coordinate activities and production planning to ensure that products meet quality standards
- Confer with clients about product specifications, vendors about purchases, management personnel about manufacturing capabilities, and staff about the status of projects.



## Work environment for an Industrial Engineer

Depending on their tasks, industrial engineers work both in offices and in the settings they are trying to improve.

For example, when observing problems, they may watch workers assembling parts in a factory or staff carrying out their tasks in a hospital.

When solving problems, industrial engineers may be in an office at a computer looking at data that they or others have collected.



## Work schedules for an Industrial Engineer

Most industrial engineers work full time.

Hours may vary, however, depending upon the projects in which these engineers are engaged, and upon the industries in which the projects are taking place.



## Education requirements for an Industrial Engineer

Industrial engineers must have a bachelor's degree.

Employers also value experience, so cooperative education engineering programs at universities are also valuable.

Many industrial engineers have degrees in mechanical engineering, manufacturing engineering, industrial engineering technology, or general engineering. Students interested in studying industrial engineering should take high school courses in mathematics, such as algebra, trigonometry, and calculus; computer science; and sciences such as chemistry and physics.





## Education requirements for an Industrial Engineer

A few colleges and universities offer 5-year degree programs in industrial engineering that lead to a bachelor's and master's degree upon completion, and several more offer similar programs in mechanical engineering. A graduate degree allows an engineer to work as a professor at a college or university or to engage in research and development. Some 5-year or even 6-year cooperative education plans combine classroom study with practical work, permitting students to gain experience and to finance part of their education.



## Desired qualities for an Industrial Engineer

***Creativity.*** Industrial engineers use creativity and ingenuity to design new production processes in many kinds of settings to reduce use of material resources, time, or labor while accomplishing the same goal.

***Critical-thinking skills.*** Industrial engineers create new systems to solve problems related to waste and inefficiency. Solving these problems requires logic and reasoning to identify strengths and weaknesses of alternative solutions, conclusions, or approaches to the problems.



## Desired qualities for an Industrial Engineer

***Listening skills.*** These engineers often operate in teams, but they must also solicit feedback from customers, vendors, and production staff. They must listen to customers and clients to fully grasp ideas and problems the first time.

***Math skills.*** Industrial engineers use the principles of calculus, trigonometry, and other advanced topics in mathematics for analysis, design, and troubleshooting in their work.



## Desired qualities for an Industrial Engineer

***Problem-solving skills.*** In designing facilities for manufacturing and processes for providing services, these engineers deal with several issues at once, from workers' safety to quality assurance.

***Speaking skills.*** Industrial engineers sometimes have to explain their instructions to production staff or technicians before they can make written instructions available. Being able to explain concepts clearly and quickly is crucial to preventing costly mistakes and loss of time.



## How much do Industrial Engineers get paid?

The median annual wage for industrial engineers was \$78,860 in May 2012.

The median wage is the wage at which half of the workers in an occupation earned more than that amount and half earned less.

The lowest 10 percent earned less than \$51,180, and the top 10 percent earned more than \$118,300.



## Industrial Engineer's work schedules

Most industrial engineers work full time, 40 hour work weeks.

Hours may vary, however, depending upon the projects on which these engineers are engaged, and upon the industries in which the projects are taking place.



## Quiz yourself

1. List 3 typical duties for an industrial engineer
2. Do industrial engineers always work in an office? Where else do they work?
3. What is the minimum education required to become an industrial engineer?
4. List 3 desired qualities for an industrial engineer.



## Helpful links

[Livescience profile on Industrial Engineering](#)

[Youtube video about what Industrial Engineers do](#)