

Food engineering is a multidisciplinary field of applied physical sciences which combines science, microbiology, and engineering education for food and related industries. Food engineering includes, but is not limited to, the application of agricultural engineering, mechanical engineering and chemical engineering principles to food materials. Food engineers provide the technological knowledge **transfer essential** to the cost-effective production and commercialization of food products and services. Physics, chemistry, and mathematics are **fundamental** to understanding and engineering products and operations in the food industry.

Food engineering encompasses a wide range of activities. Food engineers are employed in food processing, food machinery, packaging, ingredient **manufacturing**, instrumentation, and control. Firms that design and build food processing plants, consulting firms, government agencies, pharmaceutical companies, and health-care firms also employ food engineers. Specific food engineering activities include

Agricultural engineers integrate technology with farming. For example, they design new and improved farming equipment that may work more **efficiently**, or perform new tasks. They design and build agricultural **infrastructure** such as dams, water reservoirs, warehouses, and other structures. They may also help engineer solutions for pollution control at large farms. Some agricultural engineers are developing new forms of biofuels from non-food resources like algae and agricultural waste. Such fuels could economically and sustainably replace gasoline without jeopardizing the food supply.

While agricultural engineers may develop specialties, most are involved in certain core activities. For example, most professionals design and test agricultural machinery, **equipment**, and parts. They may also design food storage structures and food processing plants. Some may design housing and environments for livestock.

Those interested in sustainability may provide advice on water quality and water pollution control issues. They may also plan and **oversee** land reclamation projects on farms. Others may be involved in agricultural waste-to-energy projects and carbon sequestration (absorbing carbon dioxide from the atmosphere into the soil, crops and trees).

Agricultural engineers may perform tasks such as planning, supervising and managing the building of dairy **effluent** schemes, irrigation, **drainage**, flood and water control systems, performing environmental impact assessments, agricultural product processing and interpret research results and **implement** relevant practices .

Agriculture, Modern

During the latter half of the twentieth century, what is known today as modern agriculture was very successful in meeting a growing **demand** for food by the world's population. **Yields** of primary crops such as rice and wheat increased dramatically, the price of food declined, the rate of increase in crop yields generally kept pace with population growth, and the number of people who consistently go hungry was **slightly** reduced. This boost in food production has been due mainly to scientific advances and new technologies, including the development of new crop varieties, the use of pesticides and fertilizers, and the construction of large irrigation systems.

Basic Practices of Modern Agricultural Systems

Modern agricultural systems have been developed with two related goals in mind: to **obtain** the highest yields possible and to get the highest economic profit possible. In pursuit of these goals, six basic practices have come to form the backbone of production: intensive **tillage**, monoculture, application of inorganic fertilizer, irrigation, chemical pest control, and genetic **manipulation** of crop plants. Each practice is used for its individual contribution to productivity, but when they are all combined in a farming system each depends on the others and **reinforces** the need for using the others. The work of agronomists, specialists in agricultural production, has been key to the development of these practices.

Intensive Tillage.

The soil is cultivated deeply, completely, and regularly in most modern agricultural systems, and a vast array of tractors and farm implements have been developed to facilitate this practice. The soil is **loosened**, water drains better, roots grow faster, and seeds can be planted more easily. Cultivation is also used to control weeds and work dead plant matter into the soil.

Monoculture.

When one crop is grown alone in a field, it is called a monoculture. Monoculture makes it easier to cultivate, sow seed, control weeds, and harvest, as well as expand the size of the farm operation and improve aspects of **profitability** and cost. At the same time, monocultures tend to promote the use of the other five basic practices of modern agriculture.

Use of Synthetic Fertilizers.

Very dramatic yield increases occur with the application of synthetic chemical fertilizers. Relatively easy to manufacture or mine, to transport, and to apply, fertilizer use has increased from five to ten times what it was at the end of World War II (1939-45). Applied in either liquid or granular form, fertilizer can supply crops with readily available and uniform amounts of several essential plant nutrients.

Match the words to their meanings

Words

combine (v)

transfer (v)

essential (adj)

fundamental (adj)

manufacture (v)

efficiently (adv)

infrastructure (n)

equipment (n)

oversee (v)

effluent (n)

drainage (n)

implement (v)

Meanings

a. in an effective way

b. the basic physical structures and facilities

c. unite , merge

d. the necessary items

e. liquid waste into a river or the sea

f. put into effect

g. supervise , overlook

h. discharge sth.

i. make sth. Using machinery

j. important , essential

k. extremely important

l. move from one place to another

Definitions

Soil is the mixture of minerals, organic matter, gases, liquids .

erosion is the action of exogenic processes (such as water flow or wind) which remove soil and rock from one location on the Earth's crust, then transport it to another location where it is **deposited**

The biosphere is the global sum of all ecosystems. It can also be termed as the zone of life on Earth, a closed system (**apart** from solar and cosmic radiator and heat from the **interior** of the Earth), and largely self-regulating

An ecosystem is a community of living organisms in **conjunction** with the nonliving components of their environment (things like air, water and mineral soil), interacting as a system

A nutrient cycle (or ecological recycling) is the movement and exchange of organic and inorganic matter back into the production of living matter.

Solar energy is radiant light and heat from the Sun **harnessed** using a range of ever-evolving technologies

Biodiversity is the variety of different types of life found on Earth and the variations within species.[1] It is a measure of the variety of organisms present in different ecosystems

Climate is the long-term pattern of weather in a particular area

mass extinction or **biotic crisis** is a widespread and rapid decrease in the amount of life on Earth

Fossils (from Classical Latin fossilis; literally, "obtained by digging")[1] are the **preserved** remains or traces of animals, plants, and other organisms from the **remote** past. The totality of fossils

Pollution is the introduction of contaminants into the natural environment that cause **adverse change**.[1] Pollution can take the form of chemical substances or energy, such as noise, heat or light

A steam engine is a heat engine that performs mechanical work using steam as its working fluid.

Irrigation Technologies.

By supplying water to crops during times of dry weather or in places of the world where rainfall is not sufficient for growing most crops, irrigation has greatly boosted the food supply. Drawing water from underground wells, building **reservoirs** and distribution canals, and diverting rivers have improved yields and increased the area of available farm land. Special sprinklers, pumps, and drip systems have greatly improved the efficiency of water application as well.

Chemical Pest Control.

In the large monoculture fields of much of modern agriculture, pests include such organisms as insects that eat plants, weeds that interfere with crop growth, and diseases that slow plant and animal development or even cause death. When used properly, synthetic chemicals have provided an effective, relatively easy way to provide such control. Chemical sprays can quickly respond to pest outbreaks.

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Drainage is the natural or **artificial** removal of surface and sub-surface water from an area. Many agricultural soils need drainage to improve production or to manage water supplies.

Harvest is the process of gathering **ripe** crops from the fields . The harvest marks the end of the growing season, or the growing cycle for a particular crop.

Agronomy is the science and technology of producing and using plants for food, fuel, fiber, and land reclamation

Ecology is the scientific analysis and study of interactions among organisms and their environment. It is an **interdisciplinary** field that includes biology and Earth science

Match the words to their meanings

Words

Meanings

Deposit (v)

a. related to the inside

Apart (adv)

b. to control or to make use of

Interior (adj)

c. far or distant

Conjunction (n)

d. not natural, artful

Harness (v)

e. to put in a specific place

Preserved (adj)

f. separated from each other

Remote (adj)

g. ready for harvesting

Artificial (adj)

h. related to more than one branch of

knowledge

Ripe (adj)

i. connecting to

Interdisciplinary (adj)

j. protected, kept

Reading comprehension

Directions: Read the following passage and answer the questions that follow. Refer to the text to check your answers when appropriate.

Did you know that some people don't do their reading assignments? It's shocking, but it's true. Some students don't even read short texts that they are assigned in class. There are many reasons for this. They may be distracted or bored. They may be unwilling to focus. They may be unconfident readers. Whatever the reason, it has to stop today. Here's why.

Reading stimulates your mind. It is like a workout for your brain. When people get old, their muscles begin to deteriorate. They get weaker and their strength leaves them.

Exercise can prevent this loss. The same thing happens to people's brains when they get older. Brain power and speed decline with age. Reading strengthens your brain and prevents these declines. You can benefit from reading in the near-term.

Reading provides knowledge. Knowledge is power. Therefore, reading can make you a more powerful person. You can learn to do new things by reading. Do you want to make video games? Do you want to design clothing? Reading can teach you all this and more. But you have to get good at reading, and the only way to get good at something is to practice.

Read everything that you can at school, in any case, regardless of whether you find it interesting.

Reading expands your vocabulary. Even a "boring" text can teach you new words.

Having a larger vocabulary will help you better express yourself. You will be able to speak, write, and think more intelligently. What's boring about that?

Do not just discount a text because it is unfamiliar to you. Each time you read, you are exposed to new ideas and perspectives. Reading can change the way that you

understand the world. It can give you a broader perspective on things. It can make you worldlier. You can learn how people live in far away places. You can learn about cultures

breakdown

develop

point of view

worldly
wise

Grammar

Put the verbs between brackets in correct forms :

1. The film I (watch) now is Night and Day .
2. I (eat) a lot of ready meals because I (prefer) to do other things in the evenings .
3. He often (play) football on Fridays .
4. Amal (understand) you . She says you (stay) alone these days .

Adjectives and Adverbs

Adjectives describe nouns & adverbs describe verbs

eg. She speak French **fluently** and is an **excellent** driver .

| adj | adv |
|------|--------|
| bad | badly |
| easy | easily |

| adj | irregular adverb |
|------|------------------|
| good | well |
| fast | fast |
| hard | hard |

eg. He was a **hard worker** . He made friends **easily** and was a popular groups leader .

eg. She can sail **well** and is a **fast swimmer** (she swims **fast**)

eg. I work very **hard** (not **hardly**)

EXERCISES

Put the words between brackets in the correct forms :

1. People are worried about the threat of environmental (pollute) :
2. The (destroy) of the forests damage the ecology :
3. Some scientists believe that (globe) warming affects our climate :
4. Some people have (difficult) looking for jobs :
5. Internet has a great (important) in making the world smaller :

a ; the ; an ; =

1. Have you got a pen I can borrow ? I want to write a letter . (the first time of the)
2. Where's the pen I lent you yesterday ? (a particular pen) . This is the only pen I
3. Have you ever been to = Europe ?
4. Yes, I went on a holiday to the UK last year .
5. What did you think of = London ?
6. I think it's the most interesting city I've been to . (superlative form)
7. Have you got an English dictionary ? I want to check a meaning of a word .
8. What's the word ?

Words**meanings**

Demand

an insistent request

Yield

a full amount of an agricultural pro

slightly

a little , to a small degree

Obtain

get , acquire

Tillage

preparing land for growing crops

Manipulation

handling

Reinforce

strengthen or support

Loosen

dissolve , make sth. Less tight

Profitability

gainfulness

Reservoir

natural or artificial lake used as water

Relatively

comparatively

Boost

help to increase or improve

Drip

a small drop of a liquid

Passive voice

Here are examples of sentences written in both the active voice and the passive voice, the active voice sentence appearing first:

Harry ate six shrimp at dinner. (active)

At dinner, six shrimp were eaten by Harry. (passive)

The crew paved the entire stretch of highway. (active)

The entire stretch of highway was paved by the crew. (passive)

We are going to watch a movie tonight. (active)

A movie is going to be watched by us tonight. (passive)

I will clean the house every Saturday. (active)

The house will be cleaned by me every Saturday. (passive)

The teacher always answers the students' questions. (active)

The students' questions are always answered by the teacher. (passive)

I noticed that a window had been left open. (passive)

All the cookies have been eaten.

They will have built the stadium by next January (active)

The stadium will have been built by next January. (future perfect passive)

It isn't nice to be insulted. (passive infinitive)

You would be congratulated by Jenny. (Conditional passive)

Grammar

Words of quantity :

a little , too much , a bit of are used with uncountable nouns

a few , several , too many are used with countable nouns

plenty of is used with countable and uncountable nouns

examples :

1. There are **plenty** of tins of cat food in the cupboard .
 2. There's **plenty** of information in this book .
 3. I've got a **few** friends who recycle things .
 4. **Too many** people don't care about that .
 5. **Too much** rubbish is just thrown away .
 6. There is a **bit** of pasta here .
 7. There are **several** plastic bottles on the table .
-

Prepositions

1. I'm good **at** English and not **at** French .
2. She's excellent **at** playing on the computer .
3. Doctors are interested **in** the effect of laughing **on** our health .
4. I'm not keen **on** making others laugh .
5. He's keen **on** writing messages .
6. I was very worried **about** looking stupid in the class .
7. She's worried **about** her children . They are late .
8. He's fed up **with** his daily routine .
9. She's fed up **with** working so hard .