

UNIT 2

Agricultural Engineering

Remember the new words and word-combinations:

agricultural engineering	- агротехніка, с.г. машинобудування
agricultural practices	- с.г.операції
annual	- щорічний
application <i>n</i>	- застосування, вживання
capable	- здатний
circuit	- схема
concerned with	- пов'язаний з
consumer	- споживач
cooler	- охолоджувач
crop	- с.г. культура
distribution	- постачання
equipment	- обладнання
fiber optic	- оптоволокну
handle (<i>v</i>)	- обробляти
harvest (<i>v</i>)	- збирати врожай
heat	- тепло
implementing	- реалізація, застосування
increase (<i>v</i>)	- підвищувати, збільшувати
industry	- промисловість
machinery	- техніка
machine-tool	- верстат
operate <i>v</i>	- працювати
peripheral	- периферійний
processing	- технологічне
production	- виробництво
reduce (<i>v</i>)	- зменшувати
solid-state electronics	- електроніка твердих тіл
superconductor	- надпровідник
transmission	- передача

Task 1. Read and translate the text “Agricultural Engineering”.

Agricultural engineering incorporates many science disciplines and technology practices to the efficient production and processing of food, feed, fiber and fuels. It involves disciplines like mechanical engineering (agricultural machinery and automated machine systems), soil science (crop nutrient and fertilization, etc.), environmental sciences (drainage and irrigation), plant biology (seeding and plant growth management), animal science (farm animals and housing) and much more. Agricultural engineering means the application of engineering knowledge to agriculture.

Agricultural engineers must have a wealth of knowledge and skills to function effectively in different agricultural and agribusiness industries. They must understand that there are basic differences between agriculture and other industries. The biological factor is an important one in engineering application, and the engineer must know well the basic principles and practices of agriculture.

Changes in agricultural practices often need to make a machine adaptable or to increase its effectiveness. Processing equipment may also need changes to harvest crops mechanically, for the quality of yield of a crop may sometimes be reduced by the use of an improper machine.

Most field operations are seasonable in nature often with only a short period of time in which to do the job. Therefore field machinery in many cases has a low annual duty (i. e. very few hours of operation per year).

The field of farm machinery design gives greater opportunity to an engineer than any other field of engineering. Farm machines must work where the temperature may be above 100 F or where it is below freezing. They must be able to work in rain and in snow as well. Instead of resting on the floor of a factory, they must operate over any kind of land. They must also be designed to handle wide variations in crop and soil conditions.

Not only agricultural engineers in the field of mechanization are in demand on the farm today. Electricians, i. e. agricultural engineers capable of designing, operating, controlling and adapting any form of electric energy to farm needs are wanted by modern agriculture.

As is known, electric power has become the main source of energy in agricultural production and its sphere of application is ever increasing. For example, it is the most reasonable source of mechanical power for some kinds of equipment such as electric motors which are very suited for

farm jobs because of their automatic control, long life, compact construction, ability to run in cold or hot weather, etc. All kinds of equipment for handling milk, such as milking machines, milk coolers, water heaters and others are also operated by electricity.

The feature distinguishing agricultural engineers from other engineers is their interest and desire to solving agricultural problems.

Task 2. Give the English equivalents to the following words and word combinations; make sentences with them:

застосування інженерних знань, основні відмінності, сільськогосподарська практика, технологічне обладнання, щорічний, сільськогосподарські машини, будь-який вид ґрунту, обробляти, електрична енергія, постійно зростати, підходити для сільськогосподарських робіт, доїльні машини.

Task 3. Are the sentences true or false? Correct the false sentences:

1. The agricultural engineer must understand that there are basic differences between agriculture and other industries.

2. The biological factor is not an important one in engineering application.

3. Processing equipment also need changes to harvest crops mechanically.

4. Field machinery in many cases has a high annual duty.

5. Farm machinery must be designed to handle wide variations in crop and soil conditions.

6. Only agricultural engineers in the field of mechanization are in demand on the farm today.

7. The great effects of various types of radiation on seeds, plants, insects, and animals have not been studied and are not well known today.

Task 4. Complete the following sentences using the information from the text:

1. Agricultural engineering means the application of ... knowledge to agriculture.

2. Most field operations are ... in nature often with only a short period of time in which to do the job.

3. Instead of resting on the floor of a factory, must operate over any kind of
4. has become the main source of energy in ... production.
5. Some kinds of equipment such as are very suited for farm jobs because of their automatic control, long life, compact construction.
6. Changes in often need to make a machine adaptable or to increase its effectiveness.
7. The field of farm machinery design gives ... opportunity to an

Task 5. Answer the following questions to discuss the topic “Agricultural Engineering”.

1. What does agricultural engineering mean?
2. The biological factor is an important one in engineering application, isn't it?
3. Must the engineer know well the basic principles and practices of agriculture?
4. What engineers are in demand on the farm today?
5. What is the main source of energy in agricultural production now?
6. Are all kinds of equipment for handling milk operated by electricity?
7. What is the feature distinguishing agricultural engineers from other engineers?

Task 6. Match each word in the column A with its synonym from the column B.

A	B
1. important	a. main
2. application	b. decrease
3. basic	c. need
4. increase	d. use
5. reduce	e. output
6. land	f. weighty
7. demand	g. soil
8. production	h. rise

Task 7. Translate the text and: a) make a plan covering the main ideas of the text; b) put questions and let your group-mates answer them.

The Branches of Engineering

Civil Engineering deals with the design of large buildings, roads, bridges, dams, canals, railway lines, airports, tunnels and other constructions. A civil engineer must have a thorough knowledge of the properties and mechanics of construction materials, the mechanics of structures and soils, and of hydraulics and fluid mechanics. Among the main subdivisions in this field are construction engineering, transport engineering and hydraulic engineering.

Mechanical Engineering. Engineers in this field design, test, build, and operate machinery of all types. The field is divided into:

- machine-tools, mechanisms, materials, hydraulics and pneumatics;
- heat as applied to engines, work and energy, heating, ventilation, and air conditioning. A mechanical engineer must be trained in mechanics and hydraulics, metallurgy and machine design. A mechanical engineer designs not only the machines that make products but the products themselves.

Electrical and Electronics Engineering is the widest field of engineering, concerned with systems and devices that use electric power and signals. Among the most important subjects in the field are electric power and machinery, electronic circuits, control systems, computer design, superconductors, solid-state electronics, robotics, lasers, radar, consumer electronics, and fiber optics.

Electrical engineering can be divided into four main branches:

- electric power and machinery (engineers working in this field design and operate systems for generating, transmitting, and distributing electric power);

- electronics (deals with the research, design and application of circuits and devices used in the transmission and processing of information. The revolution in electronics is the trend towards integrating electronic devices on a single tiny chip of silicon or some other semi conductive material);

- communications and control (engineers in this field work on control systems and communication systems that are used widely in aircraft and ships, in power transmission and distribution, in automated manufacturing and robotics),

- computers (computer engineers design and manufacture memory systems, central processing units and peripheral devices).

Task 8. Choose the variant that best completes the sentence.

1. Agricultural engineering means the application of engineering knowledge to
a) industry; b) agriculture; c) machinery;
2. ... Engineering deals with the design of large buildings, roads, bridges, dams, canals, railway lines, airports, tunnels and other constructions.
a) Mechanical; b) Civil; c) Electrical and Electronics;
3. ... Engineering deals with design, test, build, and operate machinery of all types.
a) Mechanical; b) Civil; c) Electrical and Electronics;
4. A mechanical engineer must be trained in mechanics and hydraulics, metallurgy and machine
a) devices; b) design; c) parts;
5. Electrical and Electronics Engineering deals with systems and ... that use electric power and signals.
a) devices; b) mechanisms; c) machines;
6. deals with the research, design and application of circuits and devices used in the transmission and processing of information.
a) electric; b) electronics; c) computers.
7. Engineers in this field of communications and control work on control systems and communication systems that are used widely in
a) electronic; b) computers; c) aircraft.

Task 9. Substitute the definitions with the notions in the box. Translate the sentences into Ukrainian.

<p>mechanical engineer; civil engineer; mechanical engineering; electronics engineering; machine-tool; electronics; electric power;</p>
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1. _____ The science and technology concerned with the development, behaviour, and applications of electronic devices and circuits.

2. _____ The rate at which electric energy is converted to other forms of energy, equal to the product of the current and the voltage drop.
3. _____ An engineer trained in the design and construction of public works, such as bridges or dams, and other large facilities.
4. _____ A powered machine, that is used for cutting, shaping, and finishing metals or other materials.
5. _____ The branch of engineering concerned with the design, construction, and operation of machines and machinery.
6. _____ A person trained to design and construct machines.
7. _____ Engineering that deals with practical applications of electronics.

Task 10. Translate the following sentences into English.

1. Сільськогосподарське машинобудування означає застосування інженерних знань у сільському господарстві.
2. Інженер сільського господарства повинен розуміти основні відмінності між сільським господарством та іншими галуззями.
3. Фермерські машини повинні працювати за різних погодніх умов та на різних типах ґрунтів.
4. Інженери різних галузей потрібні сьогодні в Україні.
5. Більшість польових робіт є сезонними.
6. Електроенергія стала основним джерелом енергії у сільськогосподарському виробництві.
7. Технологічне обладнання потребує змін для того, щоб збирати врожай механічно.
8. Якість врожаю може бути зниженою через неправильне використання техніки.

Task 11. Complete the text using the words from the box.

Agricultural Engineers

<p><i>sales; agricultural; system; knowledge; research; attention; production; animals; provide; implementing;</i></p>
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Agriculture is a complex ... of plants, ... , chemical and mechanicals. ... engineers look at the entire situation and ... a solution to a dilemma. This can include ... a system for efficient crop

There are opportunities for agricultural engineers to work in management, ... or production. They may also be more involved in the ... end of projects. This occupation demands ... to detail and a broad array of

Task 12. a) Match the words to make phrases.

b) Use the word combinations in your own sentences.

c) Make a dialogue using both phrases and sentences.

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|-----------------|----------------|
| 1. agricultural | a. machinery |
| 2. processing | b. opportunity |
| 3. farm | c. engineering |
| 4. to harvest | d. practices |
| 5. greater | e. energy |
| 6. agricultural | f. equipment |
| 7. electric | g. suited |
| 8. very | h. crops |

Task 13. Compose a brief essay about your prosperous career. Use the following questions as a plan.

1. What sphere of engineering would you like to work? Ground your choice.
2. What education and qualifications are required for it?
3. What are the main responsibilities of your future occupation?
4. Would you like to set your own business? If yes, what would its profile be?