МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА
И ПРОДОВОЛЬСТВИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

Учреждение образования
«БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ
АГРАРНЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ»

Кафедра иностранных языков № 2

З.М. Горощеня, Н.В. Сысова, Т.В. Мороз

АНГЛИЙСКИЙ ЯЗЫК

Учебно-методический комплекс
для студентов агроэнергетического факультета
дневной формы обучения

Модуль 4

Учебно-профессиональное общение

Часть 3

Минск
БГАТУ
2011

УДК 811.111(07)
ББК 81.2Англя7
Г70

Рекомендовано научно-методическим советом
агроэнергетического факультета БГАТУ.
Протокол № 8 от 16 мая 2011 г.

Горощеня, З. М.

Г70 Английский язык : учебно-методический комплекс. Модуль 4. Ч. 3. Учебно-профессиональное общение / З. М. Горощеня, Н. В. Сысова, Т. В. Мороз. – Минск : БГАТУ, 2011. – 40 с.

Модуль 4 учебно-методического комплекса включает в себя упражнения, направленные на формирование и развитие профессиональных компетенций студентов. Цель обучения состоит в овладении студентами знаниями особенностей системы изучаемого иностранного языка в его лексико-грамматическом аспекте; социокультурными нормами производственного общения, структурой и характером профессиональной деятельности, что позволит специалисту эффективно использовать иностранный язык как средство общения в профессиональной сфере. Содержит сведения теоретического характера, аутентичные тексты и комплекс упражнений, как тренировочной, так и коммуникативной направленности по тематике модуля.

Составлен в соответствии с требованиями типовой учебной программы для высших учебных заведений по иностранному языку, утвержденной Министерством образования Республики Беларусь. Предназначен для студентов второго курса агроэнергетического факультета БГАТУ.

УДК 811.111(07)
ББК 81.2Англя7

СОДЕРЖАНИЕ

ВВЕДЕНИЕ

Главной целью обучения иностранному языку является формирование иноязычной коммуникативной компетенции специалиста, позволяющей использовать иностранный язык как средство профессионального и межличностного общения.

В русле современной образовательной идеологии иностранный язык рассматривается не только в качестве средства межкультурного общения, но и средства формирования личности как субъекта национальной и мировой культуры. Предполагается, что мировоззрение, включающее в себя ценности личности, общества, государства, а также более широкого сообщества (европейского, мирового), способствует большему взаимопониманию и сближению народов в современном поликультурном мире, а, следовательно, стабильности и устойчивости его развития.

В качестве стратегической интегративной компетенции в процессе обучения иностранным языкам выступает коммуникативная **(КК)** в единстве всех составляющих: – языковой, речевой, социокультурной, компенсаторной, учебно-познавательной компетенций.

Языковая компетенция **(ЯК)** – совокупность языковых средств (фонетических, лексических, грамматических), а также правил их использования в коммуникативных целях.

Речевая компетенция **(РК)** – совокупность навыков и умений речевой деятельности (говорение, письмо, аудирование, чтение), знание норм речевого поведения, способность использовать языковые средства в связной речи в соответствии с ситуацией общения.

Социокультурная компетенция **(СК)** – совокупность знаний о национально-культурной специфике стран изучаемого языка и связанных с этим умений корректно строить свое речевое и неречевое поведение.

Компенсаторная компетенция **(КомпК)** – совокупность умений использовать дополнительные вербальные средства и невербальные способы решения коммуникативных задач в условиях дефицита имеющихся языковых средств.

Учебно-познавательная компетенция **(УПК)** – совокупность общих и специальных учебных умений, необходимых для осуществления самостоятельной деятельности по овладению иностранным языком.

В процессе социально-гуманитарной подготовки выпускник должен развить такие метапредметные компетенции **(МПК)**, как владение методами системного и сравнительного анализа; сформированность критического мышления; умение работать в команде; владение навыками проектирования и прогнозирования; сформированность личностных качеств: самостоятельность, ответственность, организованность, целеустремленность, а также мотивационно-ценностные ориентации; умение учиться, постоянно повышать квалификацию.

В соответствии с целями и принципами социально-гуманитарной подготовки выпускник высшего учебного заведения при подготовке по образовательной программе первой ступени (специалист) должен приобрести следующие социально-личностные компетенции:

- компетенции культурно-ценностной и личностной ориентации **(ККЦЛО)**,
- компетенции гражданственности и патриотизма **(КГП)**,
- компетенции социального взаимодействия **(КСВ)**,
- компетенции коммуникации (**КК** = ЯК + РК + СК + КомпК + УПК),
- компетенции здоровьесбережения **(КЗ)**,
- компетенции самосовершенствования **(КС)**.

В результате изучения дисциплины студент должен **знать**:

- особенности системы изучаемого иностранного языка в его фонетическом, лексическом и грамматическом аспектах (в сопоставлении с родным языком);
- социокультурные нормы бытового и делового общения, а также правила речевого этикета, позволяющие специалисту эффективно использовать иностранный язык как средство общения в современном поликультурном мире;
- историю и культуру стран изучаемого языка.

Студент должен **уметь**:

- вести общение социокультурного и профессионального характера в объеме, предусмотренном настоящей программой;
- читать и переводить литературу по специальности обучаемых (изучающее, ознакомительное, просмотровое и поисковое чтение);
- письменно выражать свои коммуникативные намерения в сферах, предусмотренных настоящей программой;

- составлять письменные документы, используя реквизиты делового письма, заполнять бланки на участие и т.п.;
- понимать аутентичную иноязычную речь на слух в объеме программной тематики.

В соответствии с учебной программой по иностранному языку изучение дисциплины «Иностранный язык» рассчитано на 150 аудиторных часов.

Содержание учебного модуля **«М-4. Учебно-профессиональное общение»** представлено в Таблице.

Тема модуля	Содержание	Кол-во час.	Формируемые компетенции
Учебно-профессиональное общение **Студент должен знать**: социокультурные нормы профессионального общения; **уметь**: в письменной и устной форме аргументированно представить свою точку зрения по темам «История развития электрификации сельского хозяйства», «Основы электроэнергетики», владеть всеми видами чтения, сочетать диалогическую и монологическую формы речи, участвовать в дискуссии по изучаемым проблемам, уметь реферировать и аннотировать статьи по специальности.	Структура и характер профессиональной деятельности: применение электричества в сельском хозяйстве, агротехника. ***УСРС:*** Студенческая научно-практическая конференция. Реферирование и аннотирование статьи по специальности.	**20**	**КК** **МПК** **КГП** **КСВ** **КЗ** **КС**

УМК составлен в соответствии с требованиями Типовой учебной программы для высших учебных заведений по иностранному языку, утвержденной Министерством образования РБ. В основу структурирования содержания учебного материала положен принцип модульного похода, который предполагает разбивку учебного материала на относительно самостоятельные модули (разделы) курса.

Модуль 4 «Социокультурное общение» включает упражнения, направленные на формирование и развитие социально-личностных компетенций студентов. Цель модульного обучения состоит в овладении студентами знаниями особенностей системы изучаемого иностранного языка в его лексико-грамматическом аспекте; социокультурных норм бытового и делового общения, правил речевого этикета, позволяющих специалисту эффективно использовать иностранный язык как средство общения в современном поликультурном мире; истории и культуры стран изучаемого языка. Содержит сведения теоретического характера, аутентичные тексты и комплекс упражнений, как тренировочной, так и коммуникативной направленности по тематике модуля.

Предназначен для студентов первого курса факультета предпринимательства и управления и агроэнергетического факультета БГАТУ.

МОДУЛЬ 4

4.13-4.14 ИСТОРИЯ РАЗВИТИЯ ЭЛЕКТРИФИКАЦИИ СЕЛЬСКОГО ХОЗЯЙСТВА

Reading and speaking 1

RURAL ELECTRIFICATION

Pre-reading task

I. Study the following words from the text.

Rural electrification – сельская электрификация
failure – отказ
affordable – возможный
Governor – губернатор
Power Authority – Энергетическое управление
inexpensive – недорогой
collapse – крах, распад
Giant Power – Гигантская Власть
utility industry – сервисная промышленность
U.S. Census – американская перепись
Presidential Executive – Президентское Правительство
Rural Electrification Administration (R.E.A.) – Сельское правительство Электрификации
appropriation – ассигнование
administrative liaisons – административные связи
to provide – обеспечивать
interest rate – процентная ставка
loan – ссуда
incentive – стимул
average – показатель
electrical supply – электропитание
provision – положение

Reading

I. Read and translate the text.

The Origins of the New Deal Rural Electrification Initiative

The failure of the market to deliver affordable electricity to rural locales led to over thirty state rural power initiatives during the 1920s and early 1930s, as President Herbert Hoover argued that responsibility for rural electrification rested with state government. Governor of New York Franklin Delano Roosevelt aggressively promoted rural electrification, and the New York Power Authority was created in 1931 to develop a substantial new source of inexpensive hydroelectric generating capacity along the St. Lawrence River. But the Depression led to the collapse of many state power authorities and further raised the bar in discouraging private investment in rural electrical infrastructure. When Roosevelt assumed the Presidency on March 4, 1933, the market for new rural electrification investment no longer existed.

While Roosevelt clearly understood the benefits electrification would bring to the rural American economy, it was Morris L. Cooke who provided vision and leadership to rural electrification efforts under the New Deal. Cooke had led Giant Power, the Pennsylvania rural electrification program, and Roosevelt invited him to address the problem at the federal level. Using data supplied by the utility industry, electrical engineers, Giant Power, and the U. S. Census of 1930, Cooke authored an eleven-page report in 1934 that provided the foundation for a federal rural electrification program. Studies commissioned by Cooke suggested that household payments for electricity would be a minimum of one dollar per month for the first ten kilowatts of electricity, three cents per kilowatt for the next forty kilowatts, and two cents per kilowatt for the remaining balance. Consequently, Cooke's high-end estimate for the complete electrical infrastructure needed to bring electrical service to 500,000 rural American farms was $200 million, or $400 per farm. The concluding paragraph of his report states that a new "rural electrification agency" should build the necessary infrastructure since the market would not otherwise furnish electricity to sparsely populated localities.

Presidential Executive created the Rural Electrification Administration, or R.E.A., on May 11, 1935. With passage of the

Norris-Rayburn Act the following year, Congress authorized $410 million in appropriations for a ten-year program to electrify American farms. The rural cooperative model, which had been successfully employed by Giant Power in Pennsylvania, was adopted by the R.E.A., with Congressional Representatives serving as the administrative liaisons for the formation of cooperatives within their districts. Cooperatives were not-for-profit consumer-owned firms organized to provide electric service to member-customers. Each cooperative was typically governed by a board of directors elected from the ranks of its residential customers. The board established rates and policies for the cooperative, and hired a general manager to conduct the ordinary business of providing electricity to customers within the service region.

The R.E.A. was essentially a government-financing agency providing subsidized loans to private companies, public agencies, or cooperatives for the construction of electrical supply infrastructure in rural regions. The loans were guaranteed by the federal government and had an attractive interest rate and a generous repayment schedule of twenty-five years. The interest rate initially matched the federal funds rate when the loan was executed, but after 1944 the rate was fixed at two percent. R.E.A. loans furnished the incentive for rural electric cooperatives to form and connect to the existing electrical network at rates comparable to the national average. R.E.A. cooperatives quickly became one of the largest capital investment projects of the New Deal, and low-cost financing for construction of electrical supply infrastructure was the key provision of the program.

Comprehension

I. Answer the following questions

1. Why did Governor of New York Franklin Delano Roosevelt aggressively promote rural electrification?
2. When did create the New York Power Authority?
3. In what the Depression has resulted?
4. What did write Morris L. Cooke?
5. What did suggest studies commissioned by Cooke?
6. Did Presidential Executive create the Rural Electrification Administration?

7. When did create the R.E.A.?
8. Was the R.E.A. essentially a government-financing agency providing subsidized loans to private companies?
9. Did R.E.A. cooperatives become one of the largest capital investment projects of the New Deal?

II. Match the sentence beginnings to the correct endings.

1. Governor of New York Franklin Delano Roosevelt promoted…
2. The Depression led to…
3. Cooke authored an eleven-page report that…
4. Presidential Executive created…
5. The loans were guaranteed by…
6. The interest rate initially matched the…
7. R.E.A. cooperatives quickly became…

a) … one of the largest capital investment projects of the New Deal.
b) … federal funds rate.
c) … the federal government.
d) … the Rural Electrification Administration.
e) …provided the foundation for a federal rural electrification program.
f) … the collapse of many state power authorities.
g) … rural electrification.

III. Give the English equivalents for the following word combinations.

Электричество, региональное правительство, продвигать сельскую электрификацию, развивать новый источник, привести к краху, государственная власть, рынок для инвестиций, рассматривать проблему на федеральном уровне, инженер-электрик, создать отчет, два процента за киловатт, остаток на счете, высокий уровень, экономическая инфраструктура, американская ферма, находиться в собственности потребителя, совет директоров, генеральный директор, частная компания, инфраструктура электропитания, график выплаты, средний национальный показатель, финансирование строительства, проект капиталовложения, ключевое положение программы.

IV. Write a resume of 60-70 words of the text.

Reading and speaking 2

ENERGY

Pre-reading task

I. What do we need energy for? Make a list of the uses of energy and compare it with that of your partner.

II. Study the following words from the text.

waterwheel - водяное колесо
windmill - ветряная мельница
coal - уголь
constantly – непрерывно, постоянно
evident – явный, очевидный
twice – дважды, удвоить
pursuit – преследование, стремление
quantity – количество, величина, размер
current - ток
shortage – нехватка, недостаток
prospect – шанс, надежда, исследование
energy cost - энергозатраты
steam engine – паровая машина, паровой двигатель
consumption – потребление, затрата
oil-equivalent – нефтяное оборудование
usable – годный к употреблению, практичный

III. Read these figures: 6,000; 100,000; 340,000; 1/2; 1/3; 1/4; 1/6; 1.3; 700; 1,000,000.

Reading

I. Read and translate the text.

Energy

Energy is an essential part of our civilization. A million years ago primitive man used only 6,000 (kJ) a day, which he got from the food

he ate. A hundred thousand years ago people had learnt to make fire and used four times as much energy (the equivalent of 25,000 kJ). By the 15th century man using animals, windmills and waterwheels, and a little coal, was already consuming nearly twenty times as much energy (120,000 kJ). By 1875 the steam engine made 340,000 kJ a day available to industrial man in England. Today's technological man uses 1.000,000 kJ a day, or one hundred and fifty times as much as primitive man, about one third in the form of electricity.

Why is our energy consumption constantly increasing and accelerating? The reasons are evident. Technological man lives four times as long as primitive man and twice as long as man in the 15th century. Nearly half of man's lift today is spent on educating himself, leisure and creative activities. Medieval man spent only a quarter of his thirty-five years in these pursuits, and primitive man only one sixth in his short life of eighteen years.

What do we need energy for? Comfort and lighter work, first of all. Energy consumed in great quantities falls into two kinds: a) energy needed every day (lighting, boating, etc.) and b) energy used o produce necessary objects (house, clothes, etc.). Take a man building a small house (10 tons of oil-equivalent), heating (3 tons of oil-equivalent) and lighting (200 kg of oil-equivalent or 700 kWh) it for a year and having a car (1.3 tons of oil-equivalent + 1.3 tons for every 12,000 km run). The energy costs of these basic things is tremendous but multiply it by 6 billion to get the real picture of man's needs. Besides, energy consumption is sure to increase since the more energy is consumed, the easier our life becomes.

The current energy problem caused by many interrelated factors must be tackled quickly. Strange as it sounds, there is no shortage of primary energy. The sun provides ten thousand times as much energy is we require today, in many forms ranging from solar radiation through wind and waves to trees and plants. The problem is to convert these resources into mechanical work or other usable forms of energy. The history of energy has been the history of converters - man's body itself converting food into warmth and mechanical work, animals doing such work more powerfully, the waterwheel, the windmill, the steam engine, the nuclear reactor and in the near future, the solar cell.

Comprehension

I. Answer the questions.

1. How did primitive man get the energy he needed?
2. How much energy does man consume today?
3. What does technological man do half of his life?
4. In what two ways is energy used?
5. What is the standard measurement of energy cost?
6. Does the car require much energy?
7. Why is it essential to cut energy consumption?
8. What is the primary source of energy?

II. Complete the table with the information from the article.

Time	Man	Years of life	Energy consumption	Why?
…	…	…	…	…

Consider food, domestic consumption, services (trade, office work, teaching, leisure), industry and agriculture, transport.

III. Read the text and say if you agree or disagree with the following statements.

1. A million years ago primitive man used only 8,000 (kJ) a day.
2. Today's technological man uses 1.000,000 kJ a day.
3. Nearly half of man's lift today is spent on educating himself, leisure and creative activities.
4. Energy consumed in great quantities falls into five kinds.
5. The sun provides ten thousand times as much energy is we require today.

IV. Look through the text once again and make a logical plan of it. Using the plan retell the text.

4.15-4.17 ОСНОВЫ ЭЛЕКТРОЭНЕРГЕТИКИ

Reading and speaking 1

ELECTRICITY

Pre-reading task

I. Answer the questions.

1. Are you good at electricity?
2. Do you know what DC and AC mean?
3. How are they produced?
4. What are their functions?

II. Study the following words from the text.

Current – ток
force – сила
heartbeat – сердцебиение, сокращение сердца
prevalent – распространенный, общепринятый
power – сила, мощь
nuclear - ядерный
photovoltaic - фотогальванический
fuel cell – топливный элемент
direct current – постоянный ток
alternating current – переменный ток
domestic – бытовой, домашний
circuit – окружность, круг, участок
frequency – частота, частотность
appliance – прибор, устройство, приспособление

Reading

I. Read and translate the text.

Electricity

Electricity is a from of energy produced by the movement of electrons. Electricity is made by converting some of energy into flowing electrons at the power plant. The type of power plant depends on the source of energy used: thermal power (coil, oil, gas, nuclear, underground steam), solar power (photovoltaic), kinetic power (water, wind) and chemical power (fuel cell).

After it is made, electricity is sent into a system of cables and wires called a transmission grid. This system enables power plants and end users to be connected together.

Electricity is electrical power or an electric current. This form of energy can be sent through wires in a flow of tiny particles. It is used to produce light and to run motors.

There are different kinds of electrical current. One is called direct current because electrons are made to move in one direction only. It is usually abbreviated to DC. This kind of electricity is produced by a battery.

AC stands for alternating current which is generated by power stations for domestic and industrial use. The wires in the centre of the generator rotate past the North and South poles of the (red) magnet. This movement forces the electrons in the circuit to reverse the direction of their flow. The number of these alterations (or cycles) per second is known as frequency.

As domestic supply requires alternating current it is therefore necessary to change it to direct current inside most electrical appliances. A rectifier allows AC to be converted into DC.

Electricity is a basic feature of all matter, of everything in the universe. Electrical force holds atoms and molecules together. Electricity determines the structure of every object that exists. Together with magnetism, it causes a force called electromagnetism, a fundamental force of the universe.

Electricity or electrical signals are essential to many biological processes. In our bodies, electrical signals are carrier through the

nervous system, moving information to and from the brain. Electrical signals communicate to our brain what the eyes see, what the ears hear, and what the fingers feel. Electrical signals from our brain causes our muscle movement. Electrical signals cause each heartbeat.

One of the most important forms of electricity is an electrical current. During the industrial revolution of the 1800s, people began to find ways to use electricity to do work. Today electricity is used throughout our homes, at work, in communication, in transportation, and in medicine and science. Electrically powered devices are prevalent. Relatively cheap electricity has made electrical appliances, machines, and other devices possible.

Comprehension

I. Say if the following statements are true or false. Correct the false statements.

1. Electricity is electrical power or a flow of tiny particles.
2. Electrical force holds atoms and molecules together.
3. Electricity is essential to many people.
4. Electricity powered devices are prevalent.
5. Electrical signals cause each heartbeat.
6. DC is received from a battery.
7. There are two different kinds of electricity: AC and DC.
8. AC is used for domestic and industrial purposes.

II. Answer the questions.

1. Is electricity an electrical power?
2. Where can be used electrical power?
3. What does hold electrical force?
4. Electricity determines the structure of every object that exists, doesn't it?
5. Is electricity essential to many biological processes?
6. Is the electrical power one of the most important forms of electricity?
7. Where is used electricity today?
8. Is electricity used today in science?

III. Choose the correct opinion to complete the sentences.

1. Electricity is a basic feature of all…
a) current
b) matter
c) processes

2. Direct current is produced by …
a) a battery
b) an electron
c) a circuit

3. Electrical signals cause each…
a) heartbeat
b) toothache
c) headache

4. In man's body, electrical signals are carried through the…
a) nervous system
b) blood
c) head

5. Electric force holds … together.
a) all atoms
b) all molecules
c) all atoms and molecules

IV. Complete the sentences

1. Electricity is a form…
2. Electricity is a basic…
3. Electrical force holds…
4. Electrical signals are…
5. Electrical signal communicate…
6. One of the most important forms of electricity…
7. Today electricity is used…

V. What new information have you learnt about electricity from the text? What things have you already known?

Reading and speaking 2

ELECTRIC FIELD

Pre-reading task

I. Answer the questions.

1. What do you know about electric field?
2. What do you know about Michael Faraday?

II. Read some interesting facts about Michael Faraday.

Well regarded as one of the most influential scientists of all time, Michael Faraday was a British physicist and chemist whose combined expertise led to the development of many of today's common technologies. Read on for interesting facts, quotes and information about Michael Faraday.

Michael Faraday was born in England on the 22nd of September 1791 and died on the 25th of August 1867.

- His work on electrochemistry and electromagnetism laid the foundation for many areas of science. He formed the basis of the electromagnetic field concept in physics, discovered the laws of electrolysis, invented electromagnetic rotary devices that were vital in the creation of electric motors and played a key role in the development of electricity for use in technology.
- Not limited to physics and electromagnetism, Faraday also invented a simple Bunsen burner, coined terms such as electrode, cathode, anode and ion, discovered benzene and investigated the nature of chlorine.
- Faraday had only a basic education in a family that was not well off. He had only a minimal understanding of technical mathematical concepts but was still able to produce some of the most important scientific concepts in history and did so in a language that was clear and easily understood.

- Faraday was a man of honor who was strong in his convictions. He rejected both a knighthood and an offer to become President of the Royal Society as well turning down a burial in Westminster Abbey. He also refused to assist the British government in the production of chemical weapons for use in war.
- Famous Michael Faraday quotes include: "But still try, for who knows what is possible."
- "Nothing is too wonderful to be true, if it be consistent with the laws of nature."
- "There is no more open door by which you can enter into the study of natural philosophy than by considering the physical phenomena of a candle."
- "I was at first almost frightened when I saw such mathematical force made to bear upon the subject, and then wondered to see that the subject stood it so well."

What new information have you learnt?

III. Study the following words from the text.

Force – сила
gravity – тяжесть, сила тяжести
attraction – притяжение
repulsion- отталкивание, отражение
to carry – нести, относить
vanishingly – ищезающе
to prevent – предотвращать, препятствовать
charge – нагружать, загружать
imaginary – воображаемый, нереальный
path – путь, канал, цепь
to permeate – проникать
conductor – проводник
properties – свойства
cage – клетка
to isolate – изолировать, отделять

Reading

I. Read and translate the text.

Electric field

The concert of the electric field was introduced by Michael Faraday. An electric field is created by a charged body in the space that surrounds it, and results in a force exerted on any other charges placed within the field. The electric field acts between two charges in a similar manner to the way that the gravitational field acts between two masses, and like it, extends towards infinity and shows an inverse square relationship with distance. However, there is an important difference. Gravity always acts in attraction, drawing two masses together, while the electric field can result in either attraction or repulsion. Since large bodies such as planets generally carry no net charge, the electric field at a distance is usually zero. Thus gravity is the dominant force at distance in the universe, despite being much weaker.

An electric field generally varies in space, and its strength at any one point is defined as the force (per unit charge) that would be felt by a stationary, negligible charge if placed at that point. The conceptual charge, termed a 'test charge', must be vanishingly small to prevent its own electric field disturbing the main field and must also be stationary to prevent the effect of magnetic fields. As the electric field is defined in terms of force, and force is a vector, so it follows that an electric field is also a vector, having both magnitude and direction. Specifically, it is a vector field.

The study of electric fields created by stationary by stationary charges is called electrostatics. The field may be visualized by a set of imaginary lines whose direction at any point is the same as that of the field. This concept was introduced by Faraday, whose term 'lines of force' still sometimes sees use. The field lines are the paths that a point positive charge would seek to make as it was forced to move within the field; they are however an imaginary concept with no physical existence, and the field permeates all the intervening space between the lines. Field lines emanating from stationary charges have several key properties: first, that they originate at positive charges and terminate at negative

charges; second, that they must enter any good conductor at right angles, and third, that they may never cross nor close in on themselves.

A hollow conducting body carries all its charge on its outer surface. The field is therefore zero at all places inside the body. This is the operating principal of the Faraday cage, a conducting metal shell which isolates its interior from outside electrical effects.

Comprehension

I. Choose the correct opinion to complete the sentences.

1. The concept of the electric field was introduced by.
a) Antonio Volta
b) Michael Faraday
c) William Gilbert

2. An is created by a changed body in the space that surrounds it.
a) electric field
b) electric potential
c) electronics

3. Gravity always acts in.
a) repulsion
b) induction
c) attention

4. A conducting metal shell which isolates its interior from outside.
a) electrical fields
b) electrical effects
c) electrical magnets

II. Say if the following statements are true or false. Correct the false statements.

1. The concept of the gravitational field was introduced by Michael Faraday.

2. The electric fields act between three charges in a similar manner to the way that the gravitational field acts between three masses.

3. Gravity always acts in attraction.
4. An electric field generally varies in spice.
5. The field is therefore zero at places inside the body.

III. Answer the questions.

1. Who introduced the concept of the electric field?
2. An electric field is created by a charged body in the space that surrounds it, isn't it?
3. Does the electric field act between two charges in a similar manner to the way?
4. Is gravity the dominant force at distance in the universe?
5. What is a vector field?
6. Is the field there fore zero at all places inside the body?

IV. Give the gist of the text. Start with the words given below.

1. In this text we look at…
2. The text deals with…
3. The text gives information on…
4. The text is about…

Reading and speaking 3

ELECTRIC POTENTIAL

Pre-reading task
I. Study the following words from the text.

To require – приказывать, требовать, нуждаться
to define – определять
to measure – мера, единица измерения
coulomb – кулон, Кл (единица измерения электрического заряда)
application – просьба, заявление
conservative – консервативный, традиционный

to identify – устанавливать, определять, отождествлять
voltage – напряжение
reference – ссылка, сноска
to assume – принимать, обретать
to charge – загружать, наполнять
scalar – скаляр; скалярный; скалярная величина
quantity – количество, численность
height – высота, верхушка
equal – равный, одинаковый, идентичный
equipotential – эквипотенциаль, эквипотенциальный
surface – поверхность
gradient – отклонение, угол наклона
slope – наклон, уклон

Reading
I. Read and translate the text.

Electric potential

The concept of electric potential is closely linked to that of the electric field. A small charge placed within an electric field experiences a force, and to have brought that charge to that point against the force requires work. The electric potential at any point is defined as the energy required to bring a unit test charge from an infinite distance slowly to that point. It is usually measured in volts, and one volt is the potential for which one joule of work must be expended to bring a charge of one coulomb from infinity. This definition of potential, while formal, has little practical application, and a more useful concept is that of electric potential difference, and is the energy required to move a unit charge between two specified points. An electric field has the special property that it is conservative, which means that the path taken by the test charge is irrelevant: all paths between two specified points expend the same energy, and thus a unique value for potential difference may be stated. The volt is so strongly identified as the unit of choice for measurement and description of electric potential difference that the term voltage sees greater every day usage.

For practical purposes, it is useful to define a common reference point to which potential may be expressed and compared. While this could be at infinity, a much more useful reference is the Earth itself, which is assumed to be at the same potential everywhere. This reference point naturally takes the name earth or ground. Earth is assumed to be an infinite source of equal amounts of positive and negative charge, and is therefore electrically uncharged – and unchargeable.

Electric potential is a scalar quantity, that is, it has only magnitude and not direction. It may be viewed as analogous to height: just as a released object will fall through a difference in heights caused by a gravitational field, so a charge will 'fall' across the voltage caused by an electric field. As relief maps show contour lines marking points of equal height, a set of lines marking points of a equal potential (known as equipotentials) may be drawn around an eletrostatically charged object. The equipotentials cross all lines of force at right angels. They must also lie parallel to a conductor's surface, otherwise this would produce a force that will move the charge carriers to even the potential of the surface.

The electric field was formally defined as the force exerted per unit charge, but the concept of potential allows for a more useful and equivalent definition: the electric field is the local gradient of the electric potential. Usually expressed in volts per metre, the vector direction of the field is the line of greatest slope of potential, and where the equipotentials lie closest together.

Comprehension

I. Answer the questions.

1. What do you know about the concept of electric potential?
2. What is usually measured in volts?
3. What has the definition of potential?
4. What has the electric field?
5. Earth is assumed to be an infinite souse of equal amounts of positive and negative charge, isn't it?
6. Was the electric field formally defined as the force exerted per unit charge?

II. Choose the correct opinion to complete the sentences.

1. The concept of electric potential is closely linked to that of the:
a) electric potential
b) electric field
c) electricity

2. An electric field has:
a) the special property
b) the energy
c) the gravitational field

3. The volt is so strongly indentified as the unit of choice for measurement and description of … difference that.
a) electric field
b) gravitational field
c) electric potential

4. The … was formally defined as the force exerted per unit charge.
a) electric field
b) gravitational field
c) electric potential

III. Complete the sentences.

1. The concept of electric potential is closely…
2. The electric potential at any point is…
3. An electric field has …
4. The volt is…
5. Earth is assumed to be…
6. The electric field was …
7. Usually expressed in volts …

IV. Translate the sentences into Russian using your active vocabulary.

1. A small charge placed within an electric field experiences a force, and to have brought that charge to that point against the force requires work.
2. The volt is so strongly identified as the unit of choice for measurement and description of electric potential difference that the term voltage sees greater every day usage.
3. For practical purposes, it is useful to define a common reference point to which potential may be expressed and compared.
4. The electric field was formally defined as the force exerted per unit charge, but the concept of potential allows for a more useful and equivalent definition: the electric field is the local gradient of the electric potential.

V. Give another title to the text. Can you render its contents in 6 simple sentences?

4.18 УСРС № 6

Рекомендуемое задание: подготовить доклад (сообщение) на тему, согласованную с преподавателем.

Форма контроля: реферат-перевод.

4.19-4.21 РЕФЕРИРОВАНИЕ И АННОТИРОВАНИЕ СТАТЕЙ ПО СПЕЦИАЛЬНОСТИ

SUMMARY AND ANNOTATION

I. Read the following words.

Summary/ abstract/ precis – реферат
annotation – аннотация
aim/ object/ purpose – цель
intention – намерение
action – действие
effect/ function – роль, функция
approach – подход
method/ technique – метод
manner/ way – способ

suggestion – предположение
trend/ tendency – тенденция
task – задача
to sum up/ summarize – подвести итог, подытожить, резюмировать
to assume - считать, полагать, допускать
to consider – считать, рассматривать
to expect – ожидать, предполагать
to find/ reveal – находить, обнаруживать
to maintain – утверждать
to intend – намереваться
to show/ demonstrate – показывать, демонстрировать
to suppose/ suggest – предполагать
to report – сообщать
to interpret – объяснять, интерпретировать
to think/ reckon – считать
to prove/ give evidence – доказывать

II. Read and translate the instruction.

The reading of original literature is crucial to get the latest information. Summary (abstract, precis) and annotation have become important forms of such information providing. These forms can essentially reduce the specialists' time of information (data) processing.

Summary is a short written account of something, which gives the important points but not the details. It is usually opens an article or a report. It can be considered as a shortened version of original. The summary is excepted to be about a sixth or a tenth of the original in length. It is usually far easier to write it after you have read the original. First go through it lifting out important information, findings, conclusions and recommendations. It is necessary to avoid including excessive background and detail. Sometimes the summary may take a spoken form. To prepare a summary you should:

1. Study the work carefully;
2. Make definite opinion of what has been read;
3. Develop the appropriate style of writing;
4. Communicate accurately the author's conclusions;
5. Write briefly and clearly.

The head-line.
The text is head-lined …
The head-line of the text under discussion is …
The author of the text.
The author of the text is …
The text is written by …
The main idea of the text.
The main idea of the text is…
The text is about….
The text deals with…
The purpose of the text is to give the reader some information on…
The contents of the text.
The author starts retelling the readers about…
The author writes that…
According to the text …
Further the author says that…
In conclusion…
Your opinion of the text.
I found the article (the text) interesting (important, dull, too)…

Annotation is the extremely brief account of the main contents like the list of major problems. If the purpose of summary is to get the reader acquainted with the main contents of the original and the substitute it to some degree, the annotation considers only the article's or the book's topic and facilitates search of necessary information on the subject. To make annotation, you should do the following:

1. Write down the name of the original (article or book) in English.
2. Translate this into Russian.
3. Write down the publishing data of the article (book).
4. Resume briefly (in 3-6 sentences) the contents of the original.

The following phrases normally open summaries and annotations:

The article is concerned with …
The text deals with …
The text is about …
This work is devoted to …
… are considered in the text.

The difference between … is emphasized.
In addition the author considers …
Mention was made of the new achievements in the field of …
Special emphasis is laid on …
Particular attention is given to …
Notice has been taken to …
It is known (thought) that …
A new method (approach) has been proposed …
The author considers some facts relating to … They are …
In conclusion, the author emphasizes that…
Finally … are considered.
The author comes to the conclusions …
The work is of primary interest (importance, value) for …

III. Answer the questions.

1. What is a definition of a summary?
2. Is it difficult to write summaries?
3. What phrases are typical for a summary or an annotation opening?
4. What technique can be proposed for making an annotation?
5. How long can it take you to write a summary?

Reading and speaking 1

GENERATORS

Pre-reading task
I. Study the following words from the text.

Direct-current generator – генератор постоянного тока
armature – арматура, якорь , броня, защитная структура
to revolve – вращать
unidirectional – однонаправленный
to accomplish – осуществлять
commutator – коммутотор, коллектор
split – разрезанный
to insulate – изолировать, отделять
brushes – щетки
alternately – поочередно

circuit – окружность, круг, участок
to occur – происходить, случаться
rectifier – очиститель, выпрямитель
drum – барабан
longitudinal – продольный; продольный брус, балка
core – центр, сердцевина, ядро
wire – проволока
to add – прибавлять, присоединять
to cause – вызывать
flux - поток

Reading

1. Read and translate the text.

Direct-current (DC) generators

If an armature revolves between two stationary field poles, the current in the armature mover in one direction during half of each revolution and in the other half. To produce a steady flow of unidirectional, or direct current from such a device, it is necessary to provide a means of reversing the current flow outside the generator once during each revolution. In older machines this reversal is accomplisher by means of a commutator – a split metal ring mounted on the shaft of the armature. The two halves of the ring are insulated from each other and serve as the terminals of the armature coil. Fixed brushes of metal or carbon are held against the commutator as it revolves, connecting the coil electrically to external wires. As the armature turns, each brush is in contact alternately with the halves of the commutator, changing position at the moment when the current in the armature coil reverses its direction. Thus there is a flow of unidirectional current in the outside circuit to which the generator is connected. DC generators are usually operated at fairly low voltages to avoid the sparking between brushes and commutator that occurs at high voltage. The highest potential commonly developed by such generators is 1500V. In some newer machines this reversal is accomplished using power electronic devices.

Modern DC generators use drum armature that usually consist of a large number of windings set in longitudinal slits in the armature core and connected to appropriate segments of a multiple commutator. In an armature having only one loop of wire, the current produced will rise and fall depending on the part of the magnetic field through which the loop is moving. A to one loop of wire moving through the high-intensity area of the field, and as result the current delivered by the armature windings is virtually area of the field, and as a result the current delivered by the armature windings is virtually constant. Fields of modern generators are usually equipped with four or more electromagnetic poles to increase the size and strength of the magnetic flux of the field caused by the magnetic affect of the armature.

Comprehension

I. Answer the questions.

1. Are the two helves of the ring insulated from cask?
2. How are usually DC generators operated?
3. Is the highest potential commonly developed by such generators 1600V?
4. Where can be used modern generators?
5. How are used a commutator of mend segments?
6. Are shields of modern generators equipped with two electromagnetic poles?
7. Sometimes smaller interpoles are added to compensate for distortions in the magnetic flux of the field, aren't they?

II. Give the English equivalents for the following word combinations.

Стационарный полюс, двигаться в одном направлении, постоянный ток, изолировать друг от друга, находиться в контакте, изменение позиции, ток в катушке, менять направление, внешняя цепь, низкое напряжение, искрение между щетками и коммутатором, высокий потенциал, оснащать электромагнитными полюсами, увеличивать силу магнитного поля, магнитный эффект.

III. Write the summary, using the instruction.

IV. Write the annotation, using the instruction.

Reading and speaking 2

TRANSFORMER

Pre-reading task
I. Study the following words from the text.

EMF(electromotive force) – ЭДС(электродвижущая сила)
primary voltage(Vp) – первичное напряжение
secondary winding(Vs) – вторичная обмотка
circuit – схема, контур
inductively coupled conductor – индуктивно-связанный проводник
coil – катушка
primary winding – первичная обмотка
voltage – напряжение
mutual induction – взаимная индукция
turn – виток
alternating current – переменный ток
ferromagnetic core – ферромагнитный сердечник
air-core – воздушный сердечник
exception – исключение
range – диапазон
thumbnail-size – миниатюрный размер
grids - сети

Reading

I. Read and translate the text.

Transformer

A transformer is a device that transformers electrical from one circuit to another through inductively coupled – the transformer's coils. A varying current in the first or primary winding creates a varying

magnetic flux in the transformer's core and varying magnetic field through the secondary winding. This varying magnetic field induces a varying electromotive force (EMF) or "voltage" in the secondary winding. This effect is called mutual induction.

If a load is connected to the secondary, an electric current will flow in the secondary winding and electrical energy will be transferred from the primary circuit through the transformer to the load. In an ideal transformer, the induced voltage in the secondary winding (Vs) is in proportion to the primary voltage (Vp), and is given by the ratio of the number of turns in secondary (Ns) to the number of turns in the primary (Np).

By appropriate selection of the ratio of turns, a transformer thus allows an alternating current (AC) voltage to be "stepped up" by making Ns greater than Np, or "stepped down" by making Ns less than Np.

In the vast majority of transformers, the windings are coils wound around a ferromagnetic core, air-ore transformers being a notable exception.

Transformers range in size from a thumbnail-sized coupling transformer hidden inside a stage microphone to huge units weighing hundreds of tons used to interconnect portions of power grids. All operate with the same basic principles, although the range of designs is wide. While net technologies have eliminated the need for transformers in some electronic circuits, transformers are still found in nearly all electronic devices designed for household ("mains") voltage. Transformers are essential for high voltage power transmission, which make long distance transmission economically practical.

Comprehension

I. Answer the questions.

1. What is a transformer?
2. What is called manual induction?
3. What do you know about an ideal transformer?
4. Are transformers still found in the nearly all electronic devices designed for household voltage?
5. Are transformers essential for high voltage power transmission?

II. Give the English equivalents for the following word combinations.

Электрическая энергия, первичная обмотка, магнитный поток, магнитное поле, электродвижущая сила, взаимная индукция, находиться в пропорции, число витков, воздушный сердечник трансформатора, диапазон размеров, миниатюрный размер, соединение частей, электрическая сеть, основной принцип, новые технологии, электронная схема, высокое напряжение.

III. Write the summary, using the instruction.

IV. Write the annotation, using the instruction.

Reading and speaking 3

DYNAMO MACHINE

Pre-reading task

I. Study the following words from the text.

Capable – способный
convert – преобразование
rotation – вращение
direct current (DC) – постоянный ток
alternating current (AC) – переменный ток
rotary converter – вращающийся конвертер
winding – обмотка
coil - катушка
permanent – постоянный
curiosity – любопытство, интерес

Reading

I. Read and translate the text.

Dynamo machine

The dynamo was the first electrical generator capable of delivering power for industry. The dynamo uses electromagnetic principles to convert mechanical rotation into a pulsing direct electric current through the use of a commutator. The first dynamo was built by Hippolyte Pixii in 1832.

Through a series of accidental discoveries, the dynamo became the source of many later inventions, including the DC electric motors, the AC alternator the AC synchronous motors, and the rotary converter.

A dynamo machine consists of a stationary structure, which provides a constant magnetic field, and a set of rotating windings which turn within that field. On small machines the constant magnetic field may be provided by one or more permanent magnets; larger machines have the constant magnetic field provided by one or more electromagnets, which are usually called field coils.

Large power generation dynamos are now rarely seen due to the now nearly universal use of alternating current for power distribution and solid state electronic AC to DC power conversion. But before the principles of AC were discovered, very large direct-current dynamos were the only means of power generation and distribution. On power generation dynamos are mostly a curiosity.

Comprehension

I. Answer the questions.

1. Was the dynamo the first electrical generator?
2. Does the dynamo use electromagnetic principles to convert mechanical rotation into a pulsing direct electric field?
3. Who built the first dynamo?
4. Was the dynamo become the source of the DC electric motor?
5. Does the dynamo consist of a stationary structure?
6. What does provide a constant magnetic field?

II. Give the English equivalents for the following word combinations.

Электрический генератор, способный доставлять, электромагнитный принцип, механическое вращение, случайное открытие, позднее изобретение, синхронный двигатель, постоянное магнитное поле, повсеместное использование переменного тока, распределение электроэнергии.

III. Write the summary, using the instruction. **ДЛЯ ЗАМЕТОК**

IV. Write the annotation, using the instruction.

4.22 КОНТРОЛЬ

Подготовиться к тесту (беседе) по пройденному материалу.

ДЛЯ ЗАМЕТОК

Учебное издание

Горощеня Зоя Михайловна, **Сысова** Наталья Викторовна,
Мороз Татьяна Валентиновна

АНГЛИЙСКИЙ ЯЗЫК

Учебно-методический комплекс

Модуль 4

Учебно-профессиональное общение

Часть 3

Ответственный за выпуск *Н. В. Дорошко*
Компьютерная верстка *А. И. Стебуля*

Подписано в печать 26.10.2011 г. Формат $60\times84^{1}/_{16}$. Бумага офсетная.
Ризография. Усл. печ. л. 2,32. Уч.-изд. л. 1,81. Тираж 30 экз. Заказ 953.

Издатель и полиграфическое исполнение:
учреждение образования
«Белорусский государственный аграрный технический университет».
ЛИ № 02330/0552984 от 14.04.2010.
ЛП № 02330/0552743 от 02.02.2010.
Пр-т Независимости, 99-2, 220023, Минск.