**Профессионально ориентированный английский язык специальности Информационные системы (по отраслям)**

**Учебно-методическое пособие**

**по английскому языку**

**для специальности    09.02.04  Информационные системы (по отраслям)**

**Введение**

 Данное учебно-методическое пособие предназначено для преподавателей и студентов специальности  и 09.02.04 Информационные системы (по отраслям)  учреждений среднего профессионального образования для изучения профессионального модуля дисциплины «Иностранный язык» (английский). Пособие рассчитано на 100 часов аудиторной работы и представляет собой ряд текстов и лексико-грамматических упражнений к ним. Все упражнения носят послетекстовый характер и их выполнение направлено как на проверку понимания прочитанного, так и на формирование речевых  и грамматических навыков по изучаемой теме.

 Тексты представляют повышенный уровень сложности как в содержательном, так и в лексическом плане. В текстах представлено более детальное знакомство с компьютером,  программным и аппаратным обеспечением, устройствами ввода, хранения и вывода информации; знакомство с всемирной компьютерной сетью. В заданиях предусмотрены не просто ответы на вопросы, но и их аргументация; толкование специальных терминов на изучаемом языке.  В пособии также предусмотрены упражнения на словообразование, синонимы и антонимы, части речи и их функции в предложении,  порядок слов в предложении, времена и формы английского глагола, активный и пассивный залог. Особое внимание уделяется практике технического  перевода с родного языка на иностранный. Все перечисленные формы работы способствуют интеграции дисциплин информационного технологического цикла и английского языка и развитию как  иноязычной коммуникативной, так и профессиональной компетенций.

В конце пособия  даны тексты для дополнительного чтения. Тематика текстов отражает вопросы  современных оптических технологий и компьютерной графики.

 Работу по данному пособию рекомендуется начинать с введения тематической лексики. Дальнейшую работу над текстами и выполнение упражнений преподаватель строит по своему усмотрению. Завершать работу над изучением данной темы целесообразно выполнением контрольной работы.

Пособие может быть также использовано преподавателями английского языка учреждений среднего профессионального образования непедагогического профиля.

**Unit 1.  Science and Technology**.

**Text 1  Science.**

Before reading the text translate the following words:

Science, cover, broad,  deal with, relationship, wide, variety, search for, clue, universe, origin, cell, research,  solve, complicated,  unity, attempt,  happen,  consider, prove, divide, major, grow (grew), complicated,  boundary, clear, numerous, overlap, interconnect,  influence, provide, discovery, invention, shape, Universe, tool.

       The word “science” comes from the Latin word “scientia”, which means “knowledge”. Science covers the broad field of knowledge that deals with facts and the relationship  among these facts.  Scientists study a wide variety of subjects. Some scientists search for clues to the origin of the Universe and examine the structure of the cells of living plants and animals. Other researches investigate why we act the way we do, or try to solve complicated mathematical problems.

        Scientists use systematic methods of study to make observations and collect facts. They develop theories that help them order and unity facts. Scientific theories consist of general principals or laws that attempt to explain how and why something happens or  happened. A theory is considered to become a part of scientific knowledge if it has been tested experimentally and proved to be true.

       Scientific study can be divided  into three major groups: the natural, social and technical sciences.  As science knowledge grew and became more complicated.  Many new fields of science appeared. At the same time, the boundaries between scientific fields became less clear. Numerous areas of science overlap each other and it is often hard to tell where one science ends and another begins. All sciences are closely interconnected.

       Science has great influence on our life. It provides the basis of modern technology – the tools and machines that make our life and work easier. The discoveries and inventions  of scientists also help shape our view about ourselves and our place in the Universe.

Exercise 1. Find in the text the English for:   большая область знаний, иметь дело с, отношения между,  большое множество, и происхождение Вселенной, решать проблемы, граница между,  различать,  близко взаимосвязаны, оказывать влияние, сформировать взгляд на.

Exercise 2.  Find in the text the synonyms for:  learn, a large number of, look for, decide, difficult problems,  try,  scientific research,  major groups,  various.

Exercise 3. Choose the most suitable heading for each paragraph.

The fields of scientific research.

Different groups of sciences.

 The importance of science.

What is science?

Methods of scientific research.

Exercise 4.  Ask questions to the following sentences.

The word “science” comes from the Latin word “scientia”.

Scientists use systematic methods of study to make observations and collect facts.

Scientific study can be divided  into three major groups: the natural.

Scientists use systematic methods of study to make observations and collect facts

Science has great influence on our life.

**Text 2. Technology**

Technology means the use of people’s inventions and discoveries to satisfy their needs. Since people appeared on the Earth, they had to get food, clothes and shelter. Through the ages people invented tools, machines and materials to make work easier.

Nowadays, when people speak of technology, they generally mean industrial technology. Industrial technology began about 200 years ago with the development of the steam engine, the growth of factories, and the mass production of goods. It influenced different aspects of people’s lives. The development of the car influenced where people lived and worked. Radio and television changed their leisure time. The telephone revolutionized communication.

Science contributed much to modern technology. Science attempts to explain how and why things happen. Technology makes things happen. But not all technology is based on science. For example, people made different objects from iron for centuries before they learnt the structure of the metal. But some modern technologies, such as nuclear power production and space travel, depend heavily on science.

Exercise 1. Find in text 2 the English for: изобретения и открытия, удовлетворять потребности, инструменты, облегчить работу, промышленная технология, паровой двигатель, развитие, рост, массовое производство товаров, влиять, способствовать, делать попытку, атомная энергия, сильно зависеть от.

Exercise 2. Find in the texts the words, which have the opposite meanings to the following:

Narrow, easy, practice, to try, artificial, old, more, to begin, small, different, little

Exercise 3. Read, translate the sentences, change the words in italics into the words with similar and opposite meanings

1.He happened to meet her in that broad street. 2. They are investigating complex problems. 3. It was a very difficult experiment. 4. They started researching this problem. 5. It was a big contribution.

Exercise 4.  Fill in the blanks with the articles a, an, the where necessary.

... most common type of... computer is ... digital computer.... largest digital computers are ... parts of.... computer system that fill... large room. ... smallest digital computers — some so small they can рай through ... eye of... needle — are found inside ... watches, ... pocket calculators, and ... other devices.

Exercise 5.  a) Read and state the function of the verbs be, have

All digital computers have two basic parts: a memory and a processor. The memory is receiving data and holding them until they are needed. The memory is made up of a big collection of switches (переключатели). The processor is changing data into useful information by the converting numbers into other numbers. It reads numbers from the memory, performs basic arithmetic calculations, and puts the answer back into the memory. The processor is performing this activity and over again until the desired result is achieved. Both the memory  and the processor are electronic.

b) Fill in the blanks with the verbs be, have

People ... used calculating devices since ancient times. The first electronic digital computer ... built in 1946. The large room ... filled with the computer. Since then rapid improvement in computer technology ... led to the development of smaller, more powerful, and less еxpensive computers. But computers ... not able to think. A user... to tell the  computer in very simple terms exactly what to do with the data it receives. A list of instructions for a computer to follow ... called a program.

Exercise 6 . Mind the word order

Extend the following sentences with the words given in brackets.

1.        Scientists solve problems (complicated, some, mathematical, to try).

Researchers make observations (facts, and, collect).

The boundaries have become clear (fields, scientific, between

less).

Science has influence on lives (our, great).

Technology makes life easier (our, and, work, modern).

Put the words in the following sentences in order, the first word in each sentence is in italics.

interconnected, sciences, All, closely, are.

provides, Science, of, technology, modern, the, basis.

people, the, ages, Through, tools, invented, have, machines, materials, and.

 influenced, aspects, people's, of, different, Industrial, technology, lives.

our, time, Radio, television, and, leisure, changed.

Exercise  7.  Complete the following sentences in a logical way

The word "science" comes from ...

Science deals with ...

Scientists study...

Some scientists search for ...

Other researchers solve ...

Scientific theories consist of...

A theory becomes ...

Scientific study can be divided into ...

 The boundaries between scientific fields have become ...

Science provides ...

Technology means ...

Industrial technology began ...

Technology influenced ...

Science attempts to explain ...

Technology makes ...

Exercise 8. Make up special question according to the model, and answer them

a)        Model: Technology influences all aspects of people's life.

What does technology influence?

Science provides the basis of modern technology. 2. Technology means the use of people's inventions and discoveries to satisfy their needs. 3. This scientist uses systematic methods of study. 4. He usually tests any theory experimentally. 5. He proves it to be true.

b)        Model: Scientists can study a wide variety of subjects.

What can scientists study?

The scientists can examine the structure of the cells of living plan and animals. 2. The scientists can solve different mathematical problems. 3. Scientists can use systematic methods of study. 4. They can make observations. 5. They can develop theories.

           Exercise 9.  Make up questions the answers to which will be words in italics. The words in   brackets will   help you

     1.The word "science" means "knowledge"(what). 2. The scientists can order facts (what). 3. The scientists can unity facts (what). 4. They usually test the theory experimentally (what). 5. Technology influences      different aspects of our life (what).

       Exercise 10. Answer the following questions about science and technology.

1. What is science?
2. What is technology?
3. Are they interconnected?
4. Is all technology based on science?
5. What modern technologies depend heavily on science?
6. When did industrial technology begin?
7. When was a steam engine invented?
8. Who invented the steam engine?
9. When was radio invented?

      10. Who invented the radio?

      11. When was television invented?

      12  Who invented the television?

      13. When was a telephone invented?

       14. Who invented the telephone?

      15. When was the first car invented?

      16. When was the first digital computer invented?

      17. Who invented the first digital computer?

      18.What famous scientists do you know?

 19. What famous inventors do you know?

 20. What scientific field are you interested in? Why?

Exercise 11. Translate the following sentences from Russian into English.

1. Слово "science" происходит от латинского слова "scientia", которое означает "наука". 2. Ученые изучают широкий круг проблем. 3. Некоторые ученые ищут разгадку происхождения Bселенной. 4. Другие изучают строение клетки. 5. Некоторые исследуют причины нашего поведения. 6. Ученые используют систематические методы изучения проблем. 7. Науки могут быть разделены на три главные группы: естественные, общественные, технические науки. 8. Но границы между научными областями становятся все менее и менее четкими. 9. Все науки тесно взаимосвязаны. 10. Наука оказывает огромное влияние на нашу жизнь. 11. Она является основой современной технологии. 12. Сегодня, когда люди говорят о технологии, они имеют ввиду Промышленную технологию. 13. Промышленная технология нашла свое существование около 200 лет назад с появлением парового двигателя, ростом фабрик и массовым производством товаров. 14. Радио и телевидение изменило наш досуг; телефон произвел революцию в общении. 15. Открытия и изобретения ученых помогают нам формировать наши взгляды о себе и о нашем месте во Вселенной.

**Text 3. Computer Literacy**

 Informed citizens of our information-dependent society should be computer-literate, which means that they should be able to use computers as everyday problem-solving devices. They should be aware of the potential of computers to influence the quality of life.

 There was a time when only privileged people had an opportunity to learn the basics, called the three R's: reading, writing, and arithmetic’s. Now, as we are quickly becoming an information-becoming society, it is time to restate this right as the right to learn reading, writing and computing. There is little doubt that computers and their many applications are among the most significant technical achievements of the century. They bring with them both economic and social changes. "Computing" is a concept that embraces not only the old third R, arithmetics, but also .a new Idea — computer literacy.

 In an information society a person who is computer-literate need not be an expert on the design of computers. He needn't even know much about how to prepare programs which are the instructions that direct the operations of computers. All of us are already on the way to becoming computer-literate.

 If         you buy something with a bank credit card or pay a bill by сheck, computers help you process the information. When you check out at the counter of your store, a computer assists the checkout clerk and the store manager. When you visit your doctor, your schedules and bills and special services, such as laboratory tests, are prepared by computer. Many actions that you have taken or observed have much in common. Each relates to some aspect of a data processing system.

Exercise 1.  Translate into English and remember the following.

 Информационно-зависимое общество; человек, обладающий компьютерной грамотностью;  устройство, решающее повседневные проблемы;  понимать, сознавать;  влиять на качество жизни;  иметь возможность,  изучать основы;  научиться работе на компьютере;  наиболее значимые технические достижения;  охватывать компьютерной грамотностью;  писать программы;  направлять работу компьютера;  обрабатывать информацию;  иметь много общего;  система обработки данных.

Exercise 2. Answer the questions on the text.

I. What does "a computer-literate person" mean? 2. Are you aware of the potential of computers to influence your life? 3. What do the people mean by "the basics"? 4. What is the role of computers in our society? 5. What is "computing'? 6. What is a program? 7. Prove that we all are on the way to becoming computer-literate. 8. Give examples of using computers in everyday life.

Exercise 3.  Give the 3 forms of the verbs.

То be; to have; to mean; to learn; to become; to bring; to know; to think; to buy; to pay; to take; to do; to begin; to give; to make; to keep; to get; to read; to show.

Exercise 4. Turn the sentences into Past Simple.

1. Many people have an opportunity to use computers.  2. There is no doubt that computers solve problems very quickly.  3. Instructions direct the operation of a computer. 4. Computers bring with them both economic and social changes. 5. Computing embraces not only arithmetics, but also computer literacy.  6.It is well known that computers prepare laboratory tests.        7. Those persons are computer literate and think of buying a new computer. 8. They receive a subscription magazine once a month. 9. My mother is ill and visits her doctor every other day.  10. Experts know much about how to prepare programs.

**Text 4. The First Calculating Devices**

 Let us take a look at the history of computers that we know today. The very first calculating device used was the ten fingers of a man's hands. This, in fact, is why today we still count in tens and multiples of tens.

Then the abacus was invented. People went on using some form of abacus well into the 16th century, and it is still being used in some parts of the world because it can be understood without knowing how to read.

During the 17lh and 18th centuries many people tried to find easy ways of calculating. J. Napier, a Scotsman, invented a mechanical way of multiplying and dividing, which is now the modern slide rule works. Henry Briggs used Napier's ideas to produce logarithm tables which all mathematicians use today.

Calculus, another branch of mathematics, was independently invented by both Sir Isaak Newton, an Englishman, and Leibnitz, a German mathematician. The first real calculating machine appeared in 1820 as the result of several people's experiments.

In 1830 Charles Babbage, a gifted English mathematician, proposed to build a general-purpose problem-solving machine that he called "the analytical engine". This machine, which Babbage showed at the Paris Exhibition in 1855, was an attempt to cut out the human being altogether, except for providing the machine with the necessary facts about the problem to be solved. He never finished this work, but many of his ideas were the basis for building today's computers.

By the early part of the twentieth century electromechanical machines had been developed and were used for business data processing. Dr. Herman Hollerith, a young statistician from the US Census Bureau successfully tabulated the 1890 census. Hollerith invented a means of coding the data by punching holes into cards. He built one machine to punch the holes and others to tabulate the collected data. Later Hollerith left the Census  Bureau and established his own tabulating machine company. Through a series of merges the company eventually became the IBM Corporation.

Until the middle of the twentieth century machines designed to manipulate punched card data were widely used for business data processing. These early electromechanical data processors were called unit record machines because each punched card contained a unit of data.

In the mid—1940s electronic computers were developed to perform calculations for military and scientific purposes. By the end of the 1960s commercial models of these computers were widely used for both scientific computation and business data processing. Initially these computers accepted their input data from punched cards. By the late 1970s punched cards had been almost universally replaced by keyboard terminals. Since that time advances in science have led to the proliferation of computers throughout our society, and the past is but the prologue that gives us a glimpse of the future.

**Exercise 1.** Find in the text the English for: Вычислительное устройство; легкий способ вычисления; поэтому (вот почему); кратное десяти; изобрести механический способ умножения и деления; логарифмическая линейка; составить таблицы логарифмов; математический анализ; изобрести независимо (друг от друга); в результате; полностью исключить человека; кроме (за исключением); обработка деловой информации; средство кодирования информации; перфокарты; пробивать отверстия; оформить собранные данные в таблицу; работать с данными на перфокарте; устройство, записывающее информацию блоками; единица информации; выполнять вычисления; для научных целей; клавишный термина.

**Exercise 2**. Answer the questions.

1. What was the very first calculating device? 2. What is the abacus? 3. What is the modern slide rule? 4. Who gave the ideas for producing logarithm tables? 5. How did Newton and Leibnitz contribute to the problem of calculation? 6. When did the first calculating machine appear? 7. What was the main idea of Ch.Babbage's machine? 8. How did electromechanical machines appear and what were they used for? 9. What means of coding the data did Hollerith devise? 10. How were those electromechanical machines called and why? 11. What kind of computers appeared later? 12. What new had the computers of 1970s?

**Exercise 3.**  Form other parts of speech from the following words.

Example:  to calculate — calculating, calculator, calculation.

To compute, to invent, to know, to multiply, to divide, to depend, to solve, to provide, to process, to code, to punch, to collect, to design, to store, to contribute, to use, to manipulate, to assemble, to connect, to consume, to rely, to divide, to multiply, to inform, to instruct, to discover, to operate.

**Exercise 4.** Translate the word combinations with a) Participle 1  b) Participle 2 into Russian.

Computers using vacuum tubes; the machine calculating mathematical problems; the computer keeping instructions in its memory; binary code storing data and instructions; the vacuum tube controlling and amplifying electronic signals; computers performing computations in milliseconds; electronic pulses moving at the speed of light; students coding the information by using a binary code; devices printing the information; keyboard terminals replacing vacuum tubes.

The given information; the name given to the machine; the coded data; the device used in World War II; the invention named EN I AC; the machine called EDVAC; instructions kept in the memory; the engine designed for storing data; data stored in a binary code; vacuum tubes invented by J. Neumann; the general-purpose machine proposed by Ch. Babbage; the machine provided with the necessary facts.

**Before reading text 5,  learn these terms**

applied physics — прикладная физика

generation— создание, формирование, выработка

scientific research— научные исследования

due to the efforts  — благодаря усилиям

manipulation— управление; обработка; преобразование

to replace vacuum tubes — заменять электронные лампы

a piece of semiconductor— полупроводниковый кристалл

reduced weight— уменьшенный вес

power consumption  — потребление (расход) электроэнергии

to carry out— выполнять; осуществлять

solid body — твердое тело; кристалл; полупроводник

to respond— отвечать; реагировать

at a rate — со скоростью

integrated circuit (1С)— интегральная схема

batch processing— пакетная обработка

to assemble— собирать; монтировать

to lower manufacturing — снизить производительность

     to increase reliability— увеличить надежность

**Text  5. Development of Electronics**

Electronics is a field of engineering and applied physics dealing with the design and application of electronic circuits. The operation of circuits depends on the flow of electrons for generation, transmission, reception and storage of information.

Today it is difficult to imagine our life without electronics. It surrounds us everywhere. Electronic devices are widely used in scientific research and industrial designing, they control the work of plants and power stations, calculate the trajectories of space-ships and help the people discover new phenomena of nature. Automatization of production processes and studies on living organisms became possible due to electronics.

The invention of vacuum tubes at the beginning of the 20th century was the starting point of the rapid growth of modern electronics. Vacuum tubes assisted in manipulation of signals. The development of a large variety of tubes designed for specialized functions made possible the progress in radio communication technology before the World War II and in the creation of early computers during and shortly after the war.

The transistor invented by American scientists W. Shockly, J. Bardeen and W. Brattain in 1948 completely replaced the vacuum tube. The transistor, a small piece of a semiconductor with three electrodes, had great advantages over the best vacuum tubes. It provided the same functions as the vacuum tube but at reduced weight, cost, power consumption, and with high reliability. With the invention of the transistor all essential circuit functions could be carried out inside solid bodies. The aim of creating electronic circuits with entirely solid-state components had finally been realized. Early transistors could respond at a rate of a few million times a second. This was fast enough to serve in radio circuits, but far below the speed needed for highspeed computers or for microwave communication systems.

The progress in semiconductor technology led to the development of the integrated circuit (1С), which was discovered due to the efforts of John Kilby in 1958. There appeared a new field of science — integrated electronics. The essence of it is batch processing. Instead of making, testing and assembling descrete components on a chip one at a time, large groupings of these components together with their interconnections were made all at a time. 1С greatly reduced the size of devices, lowered manufacturing costs and at the same time they provided high speed and increased reliability.

Exercise 1. Find in the text the words and combinations: прикладная физика; передача и прием информации; поток электронов; трудно представить; научные исследования; промышленное проектирование; вычислять траекторию космических кораблей; обнаруживать явления природы; благодаря электронике; отправная точка; способствовать управлению сигналами; быстрый рост; разнообразие ламп; создание первых компьютеров; полностью заменил; полупроводниковый кристалл; уменьшить вес; сократить стоимость; потребление электроэнергии; высокая надежность; твердотельные компоненты; довольно быстро ... но гораздо ниже; высокоскоростной компьютер; микроволновые системы связи; полупроводниковая технология; область науки; интегральная схема; пакетная обработка; сборка дискретных компонентов на кристалле; снизить производственные затраты; обеспечить высокую скорость.

Exercise 2. Translate the word combinations into Russian. Mind the order of translation.

Power consumption; power consumption change; signals manipulation; transistor invention; circuit functions; communication systems, data processing system; integrated circuits development; science field; process control; automatization processes control; circuit components; size reduction; electronics development; communication means; problem solution; space exploration; pattern recognition; customers accounts; air traffic control.

Exercise 3. Answer the questions on the text.

1. What is electronics?

2. Can you imagine modern life without electronics?

3. Where are electronic devices used?

4. What was the beginning of electronics development?

5. What made the progress in radio communication technology possible?

 6. What is the transistor?

7. When was the transistor invented?

8.  What aim was realized with the invention of the transistor?

When were integrated circuits discovered?

 What advantages did the transistors have over the vacuum tubes?

Before reading text 6, learn these terms

calculating device — вычислительное устройство

multiple — кратный

abacus — счеты

slide rule— логарифмическая линейка

logarithm table — логарифмическая таблица

calculus — исчисление; математический анализ

general-purpose— общего назначения, универсальный

to cut out the human being altogether — полностью исключить человека

to manipulate— обрабатывать, преобразовывать; управлять

data processing— обработка данных (информации)

tabulate the census — занести данные по переписи (населения) в таблицу

means of coding— средства кодирования (шифровки)

to punch the holes— пробивать отверстия

punched card— перфокарта

to perform— выполнять, производить (действие); осуществлять;

unit of data— единица информации

keyboard terminals — терминал (вывод) с клавишным управлением

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**Содержание**

Введение………………………………………………………………….3

Unit 1.  Science  and  Technology…………………………………………4

Unit 2.   What is a Computer?…………………………………………… 18

Unit 3. Computer Operations and Operating Systems……………………22

Unit  4. Data Processing and Computer Systems ………………………...31

Unit 5. Central Processing Unit and Storage ……………………………..43

Unit 6. Personal  Computers and Computer  Programming ………………63

Glossary ……………………………………………………………………76

Extra reading texts………………………………………………………….87

A List of Literature …………………………………………………………95

Содержание………………………………………………………………..96