

21世纪大学实用行业英语系列



# 电子工程 与通信技术专业英语

**Specialized English for Electronics  
Engineering and Communications**

学生用书

辛 奇 麻 瑞 编 著  
蒋 蒙 安 胡 啸 冲 主 审



*Part One Electronics*

Electricity in Physics  
Semiconductor  
Resistor

*Part Two Computers*

Modern Computers  
Windows 7  
Computer Virus

*Part Three Communications*

Pulse Code Modulation (PCM)  
Interactive TV  
ADSL

.....



 复旦大学出版社

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## 内容提要

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本书由电子技术、计算机技术和通信技术三部分组成，共计十八个单元。内容突出了专业英语的实用性、科技性和与时俱进性。本书选材新颖，难度适中，可作为专业英语教学用书，也可以为爱好科技英语的人士提供相关的阅读材料。

本教材另外配有教师用书，为每课内容提供了相关的背景知识介绍、课文参考译文、课后练习答案，作为广大教师教学参考和读者自学之用。

使用本教材，建议每周安排4-6学时。教师可根据具体的教学和教学对象，对教材内容进行取舍。

# 前 言

中国人学习外语的目的之一就是能够更好地学习国外的先进科学技术。专业英语(或科技英语)教学是整个英语教学的重要组成部分,更能够直接体现这一学习目的。21世纪人类社会全面进入了信息化时代,科学技术突飞猛进,对专业人才的外语水平要求越来越高。为了更好地培养学生专业外语的能力,针对电子工程专业和通信技术专业的培养目标,并结合相关专业的最新技术,我们编写了这本《电子工程与通信技术专业英语》。

本教材由电子技术、计算机技术和通信技术三部分组成,共计18个单元。内容突出了专业英语的实用性、科技性和与时俱进性。本书选材新颖,难度适中,可作为专业英语教学用书,也可以为爱好科技英语的人士提供相关的阅读材料。具体体现如下:

- 课文取材全部源于原版最新专业英文资料,语句表达纯正、流畅,图文并茂、突出实际操作,深入浅出,易于阅读理解。
- 课文内容涉及电子学基础、电子技术、仪器仪表、计算机硬件与软件、ADSL、PCM、互动电视、光纤通信、卫星通信等方面内容,基本覆盖了当代信息技术的各个领域。
- 每课课后包含一篇与课文内容相关的阅读文章,以扩大并加强读者对相关专业知识内容的进一步了解,同时提高读者专业英语的阅读能力。
- 教材中穿插了一些专业英语基本技能介绍,包括语法、相关专业英语的特点和科技英语常见的一些表达方式等,目的在于培养学生科技英语的实用能力。
- 教材中配有部分科技英语对话,以提高学生的英语口语能力,避免科技英语就是哑巴英语的现象。
- 教材中收录了电子英语常用缩略语、常用网络用语和计算机、通信英语常用词汇,便于学生参考学习。
- 本教材另外配有教师用书,作为广大教师教学参考和读者自学之用。
- 使用本教材,建议每周安排4—6学时。考虑到具体的教学和教学对象,教师可根据需要对教材内容进行取舍。
- 本教材配有教师用书,为每课内容提供相关的背景知识介绍及课文参考译文和课后练习答案。

本书全部内容由内蒙古电子信息职业技术学院辛奇老师和麻瑞老师合作编写完成;蒋蒙安、胡啸冲老师担任本书主审,审阅了全部书稿,主持了教材出版的具体实施工作,并对教材内容提出了许多宝贵的修改意见。

由于编者水平有限,时间仓促,书中难免存在不足之处,欢迎广大教师、学生和读者批评指正。

编者

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# Part One Electronics

## Unit 1

### Electricity in Physics

**Technical terms :**

positive charge

正电荷

negative charge

负电荷

Opposites attract, likes repel.

异性相吸, 同性相斥



#### Text

Electricity works because electric charges push and pull on each other. There are two types of electric charge, positive charge and negative charge. Two positive charges repel each other. This means that if you put two positive charges close together and let them go, they would fly apart. Two negative charges also repel. But a negative charge and a positive charge attract each other. This means that if you put a positive charge and a negative charge close together, they would smack together. A short way to remember this is: Opposites attract, likes repel.

Electric charges can push or pull on each other even though they are not touching. This is possible because each charge makes an electric field around itself. An electric field is an area that surrounds a charge. At each point near a charge, the electric field points in a certain direction. If a positive charge is put at that point, it will

be pushed in that direction. If a negative charge is put at that point, it will be pushed in the exact opposite direction.

All the matter in the world is made of tiny positive and negative charges. The positive charges are called protons, and the negative charges are called electrons. Protons are much bigger and heavier than electrons, but they both have the same amount of electric charge, except that protons are positive and electrons are negative. Because “opposites attract”, protons and electrons stick together. A few protons and electrons can form bigger particles called atoms and molecules. Atoms and molecules are still very tiny. It is impossible to see them without a very powerful microscope. Any big object, like your body, has more atoms and molecules in it than anyone could count.

Because negative electrons and positive protons stick together to make big objects, all big objects that we can see and feel are electrically neutral. *Electrically* is a word meaning “describing electricity” and *neutral* is a word meaning “balanced”. That is why we do not feel objects pushing and pulling on us from a distance, like they would if everything was electrically charged. All big objects are electrically neutral because there is exactly the same amount of positive and negative charge in the world. We could say that the world is exactly balanced, or neutral. This seems very surprising and lucky. Scientists still do not know why this is so, even though they have been studying electricity for a long time.

### *New words:*

charge [tʃɑ:dʒ] *n.*

电荷

repel [rɪ'pel] *v.*

排斥, 逐退, 使……厌恶, 反驳

smack [smæk] *v.*

用掌击, 拍打

*n.*

风味, 少量, 拍击

proton ['prəʊtɒn] *n.*

质子

electron [ɪ'lektrɒn] *n.*

电子

stick [stɪk] *v.*

钉住, 粘贴, 坚持

*n.*

枝, 杖, 手杖

surround [sə'raʊnd] *v.*

包围, 环绕

*n.*

环绕物

tiny ['taɪni] *a.*

极小的, 微小的

particle ['pɑ:tlɪkl] *n.*

粒子, 极小量

molecule [ 'mɒlɪkjʊl ] <i>n.</i>	分子, 微粒
microscope [ 'maɪkrəskəʊp ] <i>n.</i>	显微镜
neutral [ 'nju:trəl ] <i>a.</i>	中立的, 中性的
<i>n.</i>	中立者
balanced [ 'bælənst ] <i>a.</i>	均衡的, 平衡的

**Expressions :**

be made up of	由……组成
except that	除了……之外, 只可惜
from a distance	从远处
in a certain direction	朝着某一方向

**Exercises****1. Translate the following phrases and expressions.**

- (1) 正/负电荷
- (2) 黏在一起
- (3) to repel each other
- (4) from a distance
- (5) be electrically charged

**2. Match Column A with Column B.**

## Column A

- (1) proton
- (2) atom
- (3) charge
- (4) molecule
- (5) electron

## Column B

- a) the quantity of unbalanced electricity in a body (either positive or negative)
- b) an elementary particle with negative charge
- c) a stable particle with positive charge
- d) the simplest structural unit of an element or compound
- e) the smallest component of an element having the chemical properties of the element

**3. Judge true or false according to the text.**

- (1) If you put two negative charges close together and let them go, they would stick together. ( )
- (2) Opposites attract, likes repel. Here "likes" is a noun. ( )

- (3) Electricity is a physical phenomena involving positive and negative charge. ( )
- (4) The motion of the positive charge will be in the direction of the E field and the negative charge will move in the opposite direction of the E field. ( )
- (5) Normally the atom is electrically neutral, the negative charge of the electrons balancing the positive charge of the proton. ( )

**4. Translate the following short passage into Chinese.**

**Renewable Sources of Electricity**

There are many other renewable sources of energy. Hydro-electric power (HEP) uses the force of water in rivers to turn turbines, which turn generators. HEP schemes are found across the Amazon River in Brazil. Wave energy is another option where the force of sea waves is used to turn turbines. Wind energy is another where the force of the wind is used to turn giant, noisy and some might say ugly “wind turbines”. However, some also enjoy the tranquil like motion of the huge blades. Solar power is another renewable energy resource where the sun’s energy is converted to electric energy by solar cells.

**5. Translate the following sentences into English.**

- (1) 异性相吸,同性相斥。
- (2) 世界上所有的物质都由微小的正负电荷构成。
- (3) 因为世界上的正负电荷数量正好相等,所以所有物体都是电中性的。



*Reading*

**Some Terms Related to Electricity**

- **Electric current** is when electric charge moves. When 1 coulomb of electricity moves past somewhere in 1 second, the current is 1 ampere.
- **Electric voltage** is the “push” behind the current. It is the amount of work per electric charge that an electric source can do. If a source can do 1 joule of work on 1 coulomb of charge, it has a 1 volt of electric potential.
- **Electric resistance** is the ability of a substance to resist the flowing of the current, i. e. to reduce the amount of current that flows through the substance. If an electric voltage of 1 volt maintains a current of 1 ampere through a wire, the resistance

of the wire is 1 ohm.

- **Electric energy** is the ability to do work by means of electric devices. Electric energy is a “conserved” property, meaning that it behaves like a substance and can be moved from place to place. Electric energy is measured in joules or kilowatt-hours (kwh). Electric energy is the amount of energy that an amount of electricity can produce at a time.
- **Electric power** is the rate at which electric energy is being used, stored, or transferred. Flows of electrical energy along power lines are measured in watts. If the electric energy is being converted to another form of energy, it is measured in watts. If it is stored (as in electric or magnetic fields), it is measured in volt-amperes reactive. If some of it is converted and some of it is stored, it is measured in volt-amperes.

### 科技英语文章文体特点

科技文章文体的特点是:清晰、准确、精炼、严密。这是在阅读和翻译英语科技文章中值得注意的现象。

#### 一、大量使用名词化结构

名词化(nominalization)是科技英语的特点之一。因为科技文体要求行文简洁、表达客观、内容确切、信息量大、强调存在的事实,而非某一行为。

Archimedes first discovered the principle of displacement of water by solid bodies.

阿基米德最先发现固体排水的原理。

句中 of displacement of water by solid bodies 系名词化结构,一方面简化了同位语从句,另一方面强调 displacement 这一事实。

The rotation of the earth on its own axis causes the change from day to night.

地球绕轴自转,引起昼夜的变化。

名词化结构 the rotation of the earth on its own axis 使复合句简化成简单句,而且使表达的概念更加确切严密。

If you use firebricks round the walls of the boiler, the heat loss can be considerably reduced.

炉壁采用耐火砖可大大降低热耗。

科技英语所表述的是客观规律,因此要尽量避免使用第一、二人称;此外,要使主要的信息置于句首。

Television is the transmission and reception of images of moving objects by radio

waves.

电视通过无线电波发射和接收活动物体的图像。

名词化结构 the transmission and reception of images of moving objects by radio waves 强调客观事实,而谓语句则着重强调其发射和接收的能力。

## 二、广泛使用被动语句

根据英国利兹大学 John Swales 的统计,科技英语中的谓语至少三分之一是被动语态。这是因为科技文章侧重叙事推理,强调客观准确。第一、二人称使用过多,会造成主观臆断的印象。因此尽量使用第三人称叙述,采用被动语态,例如:Attention must be paid to the working temperature of the machine. (应当注意机器的工作温度。)而很少说:You must pay attention to the working temperature of the machine. (你们必须注意机器的工作温度。)

此外,如前所述,科技文章将主要信息前置,放在主语部分。这也是广泛使用被动语态的主要原因。

试观察并比较下列两段短文的主语。

We can store electrical energy in two metal plates separated by an insulating medium. We call such a device a capacitor, or a condenser, and its ability to store electrical energy capacitance. It is measured in farads.

电能可储存在由一绝缘介质隔开的两块金属极板内。这样的装置称之为电容器,其储存电能的能力称为电容。电容的测量单位是法拉。

这一段短文中各句的主语分别为:

electrical energy

such a device

its ability to store electrical energy

it (capacitance)

它们都包含了较多的信息,并且处于句首的位置,非常醒目。四个主语完全不同,避免了单调重复,前后连贯,自然流畅。足见被动结构可收简洁客观之效。

## 三、非限定动词

如前所述,科技文章要求行文简练,结构紧凑,为此,往往使用分词短语代替定语从句或状语从句;使用分词独立结构代替状语从句或并列分句;使用不定式短语代替各种从句;介词+动名词短语代替定语从句或状语从句。这样可缩短句子,又比较醒目。试比较下列各组句子。

A direct current is a current flowing always in the same direction.

直流电是一种总是沿同一方向流动的电流。

Radiating from the earth, heat causes air currents to rise.



热量由地球辐射出来时,使得气流上升。

A body can move uniformly and in a straight line, there being no cause to change that motion.

如果没有改变物体运动的原因,那么物体将做匀速直线运动。

Vibrating objects produce sound waves, each vibration producing one sound wave.

振动着的物体产生声波,每一次振动产生一个声波。

In communications, the problem of electronics is how to convey information from one place to another.

在通讯系统中,电子学要解决的问题是如何把信息从一个地方传递到另一个地方。

Materials to be used for structural purposes are chosen so as to behave elastically in the environmental conditions.

结构材料的选择应使其在外界条件中保持其弹性。

There are different ways of changing energy from one form into another.

将能量从一种形式转变成另一种形式有各种不同的方法。

In making the radio waves correspond to each sound in turn, messages are carried from a broadcasting station to a receiving set.

使无线电波依次对每一个声音做出相应变化时,信息就由广播电台传递到接收机。

#### 四、后置定语

大量使用后置定语也是科技文章的特点之一。常见的结构有以下五种:

##### 1. 介词短语

The forces due to friction are called frictional forces.

由于摩擦而产生的力称之为摩擦力。

A call for paper is now being issued.

征集论文的通知现正陆续发出。

##### 2. 形容词及形容词短语

In this factory the only fuel available is coal.

该厂唯一可用的燃料是煤。

In radiation, thermal energy is transformed into radiant energy, similar in nature to light.

热能在辐射时,转换成性质与光相似的辐射能。

##### 3. 副词