中等职业学校电子信息类教材（机电技术专业）

机电专业英语

杨春生　陆荣明　袁琦睦　编
任建伟　邓　红　审

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内 容 提 要

本书按模块式结构编写，由基础模块和三个专业模块（机械、电类、数控）构成。课文选材适当，图文并茂，翻译技巧训练集中编排，便于教师组织教学和学生自学。本书可作为中等职业学校机电类及相关专业的教材，高职高专同类专业亦可选用。

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前　言

本书是以教育部制定的中等职业学校《机、电类专业英语》教学大纲为依据进行编写的。

本书在编写过程中采用了模块式结构和开放型体系，全书由一个基础模块和三个专业模块（机械模块、电类模块和数控模块）构成。通过“基础模块＋某一专业模块”的搭配或“基础模块＋不同专业模块”的选配，本书适用于机械、电子技术应用、数控和机电技术等四个专业。

在课文内容选择上，本书以实用性和适应性为出发点。所谓实用性，即针对学生今后要从事的工作，能做到学以致用，为此选用、改编了相当篇幅的操作、编程、维护手册及使用说明书（书中部分内容保持了原版风貌，就是为了使学生能身临其境，从而在今后的工作岗位上驾轻就熟）；所谓适应性，即适应当前中等职业学校学生的需要，选材时做到篇幅适中、图文并茂。另外，根据职业教育的实际需要，书中的练习侧重于对专业词汇的记忆和英译汉的训练。同时，将构词法和翻译技巧训练集中于基础模块的附录中，并配以大量的例子，以便于教师组织教学和学生自学。

本书由无锡无线电工业学校杨春生、陆荣明、袁琦睦编写，其中基础模块、数控模块由杨春生编写，机械模块由陆荣明编写，电类模块由袁琦睦编写，杨春生担任主编并统稿全书。在编写过程中，无锡无线电工业学校的任建伟、邓红两位高级讲师审阅了全稿，并提出了许多宝贵意见，在此深表感谢。此外，无锡国盛精密模具制造有限公司的施振德高级工程师、一汽柴油机股份有限公司的单金根高级工程师和无锡无线电工业学校的金卫国老师提供了部分有益的资料，编者在此一并对他们表示感谢。同时也感谢编者曾经参阅过的中外文献的作者们。限于编者的水平，书中错误和不当之处在所难免，欢迎广大读者不吝指正。

编　者

2001 年 11 月

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基 础 模 块

Lesson 1

Features of ESP

一、ESP 课程

第二次世界大战结束后，英语在国际政治、经济、文化、科技方面的作用日益显著，英语文献量呈几何级数增长，英语逐渐成为国际通用语言。为了顺应日益增长的国际交往需要，适应广大学习者的要求，语言教学作出了相应的反应。20 世纪 60 年代初，“专门用途英语”即专业英语（English for Specific Purposes/ESP）课程应运而生，其目的和内容为：

ESP courses are those in which the aims and the content are determined, principally or wholly, not by criteria of general education (as when English is a school subject), but by functional or practical English requirements of learners.

由上可知，ESP 课程是以受业者的功能需要或实际需要作为目标和内容的，它是一门应用性课程，具有明确的目的性和功利性，使学习者的专业或职业英语知识专门化。

二、ESP 与 EST

ESP 包括科技英语（English for Science and Technology/EST）、商业经济英语（English for Business and Economics）和社会科学英语（English for Social Science）三大类。它们又可分为学术英语（English for Academic Purposes）和职业英语（English for Occupational Purposes），如图 1.1 所示。学术英语和职业英语并无严格区别，前者学术性强，文体正式程度高，更严谨；后者多从职业上考虑，实用性更强。本教材即属于后一种类型。

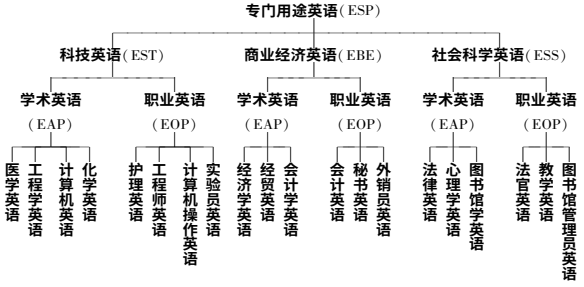

Fig. 1.1 ESP & EST

ESP 中最先出现的，设置课程最多的是 EST，因此，常常把 EST 作为 ESP 的代名词。

三、ESP 的词汇特征

词汇按其意义和用途，大致可分为三类：技术词（technical words），即科技术语；半技术词（semi-technical words），是各科通用的经典科学的基本词；非技术词，即普通词。

技术词用来记录和表述各种现象、过程、特性、关系、状态等不同名称，亦称术语。它在通篇的词量中虽占少数，但举足轻重，往往是段落或文章所要论述的中心词语。如：microprocessor（微处理器），welding（焊接），NC（Numerical Control 数控）。技术词的主要特征为：

（1）多产性：新学科的诞生、新化合物的合成、新物种的发现等，使科技术语成为最多产的一类词；

（2）单义性：对于某一特定专业或其分支，其词义狭窄，形态单一，定名时尽可能避免同形异义或同义异形现象；

（3）中性：术语只有概念意义，没有任何附加色彩。如 cat 转化为“吊锚”、dog 转化为“卡爪、止制器”后，就失去原来猫和狗的形像以及人们在用词方式上可能反映的好恶；

（4）国际性：英语和其他印欧语中的大部分技术词和半技术词来源于拉丁语和希腊语，且词汇的专业性越强，在印欧语中同形同义词越多，因而国际性也越强。另外，新创造的科技词语只要在一国使用和流行，英语国家和别的拼音文字国家就可按照语音对应规律和拼写体系转写过来，成为自己的文字。例如：transistor（晶体管）一词在英语、德语和法语中是完全一样的。

半技术词具有一定的技术含义，且各科通用。其主要特征为：词频高（比技术词高得多）、跨学科、释义少。例如：work 一词，作为普通词，一般辞典对它的释义都写得较长，有的甚至多达数页。而作为半技术词，其释义就小得多，在不同的专业里，其用法相对稳定，如：

Pushing or pulling, however, does not necessarily mean doing ***work***.

然而，推或拉未必意味着作功（物理学）。

The ***works*** of these watches are home-produced and wear well.

这些表的机件是国产的，耐磨的（机械）。

Temperature required for annealing is a function of two factors, (1) the nature of the material, and (2) the amount of ***work*** that has been done prior to annealing.

回火所需温度随两个因素而变：(1) 材料特性；(2) 退火前的加工量（机械、冶金）。

非技术词的主要特点是除了本身的结构意义或概念意义外，词义色彩中性，既没有贬褒色彩，也没有感情色彩。这与文学语体截然不同，以 beam 为例：

He ***beamed*** welcome at the distinguished visitors and complimented them on their looks.

他满面春风地向贵客们表示欢迎，恭维他们气色好。

beam 原义为“发光”、“发热”、“发射”，此处喻义为“脸上露出高兴、微笑等神情”，译为“满面春风”，形象地传达了 beam 的含义。beam 在这里带有浓重的感情色彩，但在下列专业英语例句中，却只有单一的“发射”之意了。

A robot might carry its power, for example, by storage batteries, and have its instructions ***beamed*** to it by short-wave short-range electromagnetic waves.

机器人可以携带电源，例如蓄电池，并用短波短程电磁波来为它发射信号。

ESP 词汇的文体基本特征是以少量技术词为骨干，以较多的半技术词为实体，以非技术词为纽带，逻辑严密地组织起来，通篇词汇的正式程度较高，常用缩略语，形成有特殊词汇风格的语篇。

四、ESP 的语法特点

ESP 的文体要求是条理清晰、准确凝练、逻辑严密、叙述客观，这就决定了 ESP 具有两大语法特点：名词化和被动语态。

1. 名词化(nominalization)

名词化的词主要是指表示动作或状态的抽象名词和起名词作用的非谓语动词。动词的名词化有四种形式：动作名词(action noun)、动词性名词(verbal noun)、动名词(gerund)和不定式(infinitive)，如：examination，examinating，examining，to examine。以上四类名词化形式，从动作名词到不定式，动词特性渐次加强，名词特性渐次减弱。

名词化的修辞特点为：

(1)简洁

名词化结构是以短语的形式来表达相当于一个句子所要表达的内容，结构紧凑，表达简洁。例如：

The rocket has been developed. For this reason, man can enter space.

以上两句可用两个名词化结构分别表示：The development of the rocket 和 for man to enter space。把这两个名词化结构按句法要求组织起来：

The development of the rocket makes it possible for man to enter space.

句中，make it possible 除在句法上承上启下之外，还把前因后果的逻辑推论隐含在内，表达了后句中 for this reason 的含义。

(2)确切

名词化的四种形式可以细腻地表述出科技文体在思维内容上的差别，这主要反映在名词性特征与动词性特征的程度差异上，这一区分可使语言表达得更贴切、更精细。通常，动作名词表示事实与概念，而动名词强调动作与过程。例如：

Seamless tubes without joins are made in various ways. A steel tube, for example, can be made by ***putting*** a hot 'billet' or bar of steel, say 5 inches square and 18 inches long, into a vertical round container into which it will just slide, and ***forcing*** a round punch bar (say 4 inches in diameter) almost through it, pressing the steel against the side of the container, and ***producing*** a 'bloom' shaped like a bottle with a closed end.

没有接缝的无缝管可用不同方法制造。例如，假定有一根 5 英寸见方、18 英寸长的炽热"钢坯"或棒料，把它放入一个直立的、恰能放进的圆形容器，用一根直径 4 英寸的冲杆强力穿入钢料，使之向容器壁挤压，生产出一个一端封闭的瓶形"粗坯"。

(3)客观

ESP 的特征之一是描述的客观性，避免主观因素和主观色彩。名词化是提高客观程度的手段之一。例如：

If we know the forces on the gear we can determine its size.

上句中两个分词均以 we 作主语，改用名词化结构后可去掉，显得客观。

Knowledge of the forces on the gear makes possible the determination of its size.

名词化结构与系表结构结合使用，也能对事物作客观的、静态的、抽象化的描述。例如：

Compensation of the line resistance *is possible.* 线路电阻能够补偿。

Control and timing adjustments *are* easily *accessible* on these replaceable modules.

对这些可更换的组件，可以方便地加以控制和定时调节。

(4)严密

名词化结构内部组织紧密，从逻辑上看，除了名词化的词作谓语之外，还可以具备主语、表语、状语、补语等必要的成分。例如：

brief explanation of the principle = The principle is explained briefly.

此外，名词化结构还有承上启下的作用，能使上下文语意贯通。有时名词化结构放在句首作主语，与前句的同根或同形动词相呼应。例如：

Steam which is admitted to a cold engine cylinder is liable to be partially ***condensed*** by contact with the cylinder walls. ***Condensation*** in a cylinder therefore raises the steam consumption of the engine and thereby lowers its efficiency.

进入冷的发动机汽缸的蒸汽遇到汽缸壁就部分冷凝，因此增加了蒸汽消耗量而降低了效率。

2. 被动语态

被动语态总是与非主观的文体连在一起的，在这种文体中不把自己和受话人(或读者)直接置于语境之中，因此，避免使用 I，you，we 之类的第一、第二人称代词。有一位著名语法学家研究了被动语态在各种不同文体中使用的情况，他比较了 8 种篇章类型中的使用频率，由高至低的次序为：science，news，arts，sports，speech，novels，adverting，play。由此可见 ESP(含 EST)中被动语态的使用频率是最高的。

下面以与主动态对比的方式来说明被动语态的主要文体特征。

主动态(active)	被动态(passive)
主观(personal)	客观(impersonal/factual)
随便(informal)	正式(formal)
自发的(spontaneous)	有准备的(prepared/unspontaneous)

ESP 中，被动语态通常在以下几种场合下使用：

(1)不提动作的执行者。专业英语中并不关心行为主体，有时也很难指出行为主体，动作的执行者经常是泛指的。例如：

Gears ***must*** be properly ***lubricated***.

The laws of motion ***will be discussed*** in the next article.

(2)以客体为话题。为了突出动作对象或以此为话题时，用客体作主语便于表达思想。例如：

Plastic articles ***are not damaged*** by water.

Heat and light ***are given off*** in some chemical reaction.

(3)便于句子结构安排，尤其是便于并列谓语和定语从句的安排。例如：

Madame Curie is one of the world's greatest women scientists and ***will*** always ***be remembered*** as the discoverer of radium.

居里夫人是世界上最伟大的女科学家之一，人们将永远把这位镭的发现者铭记心中(受到谓语动词表达上的限制，并列谓语前后分别用主动态和被动态)。

The three factors are interdependent, for each influences and ***is influenced*** by the actions and reactions of the others.

这三个因素相互依赖，因为它们之间的作用和反作用都是相互影响的（each **同时是** influence **动作的执行者和接受者**）。

In all types of steam engines heat ***is supplied*** by fuel which is burned outside of the engine itself.

所有蒸汽机都靠机外燃烧燃料来供热（**为了便于** which **分句表达对** fuel **的限定关系，需将** fuel **置于主句末**）。

五、ESP 翻译的基本方法

ESP **的构词法和翻译技巧见本模块附录**（Appendix）。

Lesson 2

The Information Superhighway

Welcome to the information highway.

Over the past year, the so-called superhighway has become the hottest topic in the world. What is the information superhighway? And what will it mean for people use PCs? The answers to these questions are as varied as the would-be players. Depending on whom you talk to, the highway could be the biggest leap in human communications since Sputnik, or simply more sour cream and chives for couch potatoes①.

For desktop PC users, the highway will probably look a lot like existing services, only richer with E-mail connections to tens of millions of people and access to sound and full-motion video as well as text. But this highway has the potential to go where no data has gone before into the homes of millions of people who don't own PCs②. That's because you'll also be able to access it via intelligent devices that attach to your TV or phone line, or even via wireless gadgets that fit into the palm of your hand.

The information that travels along this highway will be just as varied, from 500-plus channels of cable programming to electronic newspapers to videophone services③. The potential for widespread participation is enormous, but the reality may be something far less revolutionary. Many PC users already have this kind of person-to-person access, thanks to a host of online services. The question is whether the millions of non-PC users will enjoy similar access using devices such as their TVs.

New Words and Expressions

1. highway [ˈhɑiwei] n. **公路**
2. topic [ˈtɔpik] n. **话题,主题**
3. varied [ˈvɛərid] a. **变化的,各式各样的**
4. would-be a. **想要成为的,自称的**
5. leap [li: p] n. **跳跃,飞跃**
6. communication [kəmju: niˈkeiʃən] n. **通信**
7. Sputnik [ˈspʌtnik] n. (**苏联**)**人造地球卫星**
8. sour [ˈsɑuə] a. **酸的,发酵的**
9. cream [kri:m] n. **乳酪,奶油**
10. chive [tʃɑiv] n. **细香葱**
11. couch [kəutʃ] n. **床,睡椅**
12. potato [pəˈteitəu] n. **马铃薯**
13. probably [ˈprɔbəbli] ad. **大概,也许**
14. E-mail **电子邮件**
15. connection [kəˈnekʃən] n. **联系**
16. access [ˈ[illegible]kses] n. **访问,通路**;vt. **存取**

17. video [ˈvidiəu] n. **视频**
18. potential [pəˈtenʃəl] n. **潜能,潜力**
19. via [ˈvaiə] prep. **经,通过**
20. intelligent [inˈtelidʒənt] a. **智能的**
21. attach to **把…放在**
22. wireless [ˈwaiəlis] a. **无线的**
23. gadget [ˈgædʒit] n. **小器具,小配件**
24. palm [pɑːm] n. **手掌**
25. channel [ˈtʃænl] n. **信道,频道**
26. cable [ˈkeibl] n. **电缆;海底电报**
27. videophone [ˈvidiəufəun] n. **电视电话**
28. widespread [ˈwaidˈspred] a. **分布广泛的,普遍的**
29. participation [pɑːˌtisiˈpeiʃən] n. **分享,参与**
30. enormous [iˈnɔːməs] a. **巨大的**
31. reality [riˈæliti] n. **真实,事实**
32. revolutionary [revəˈluːʃənəri] a. **革命的**
33. person-to-person a. **私人间的,个人的**
34. thinks to **多亏**
35. host [həust] n. **主机**
36. online n. **联机;在线式**

Notes

①Depending on whom you talk to, the highway could be the biggest leap in human communications since Sputnik, or simply more sour cream and chives for couch potatoes.

句中 couch potatoes:**老泡在电视机前面的人**。

译文:这取决于你跟谁谈话,信息高速公路可能是前苏联人造地球卫星上天以来人类通信的最大飞跃,或简言之,对常看电视的人来说增添了更多的节目。

②But this highway has the potential to go where no data has gone before into the homes of millions of people who don't own PCs.

句中 before **为** ad., who **引导的定语从句修饰** people。

译文:但是信息高速公路有潜能去那些以前数据不能进入的数百万不拥有个人电脑的家庭。

③The information that travels along this highway will be just as varied, from 500-plus channels of cable programming to electronic newspapers to videophone services.

500-plus:500 **多个**。

译文:从这条高速公路上传递的信息将是多种多样的,从 500 **多个频道的有线电视节目、电子报纸到视频电话业务等**。

Exercises

1. Translate the following terms into English:

（1）信息高速公路　（2）视频电话　（3）电子报纸　（4）智能器件　（5）联机

2. Translate the following sentences into Chinese:

（1）The data highway is an elephant, let five blind people touch it, and each one will describe something different.

（2）In theory, the information superhighway will be high-speed data network, linking virtually everyone in the world to everyone else.

（3）It won't be one network but several, each with its own technology and uses.

（4）Only by obtaining a good knowledge of science, can we live successfully in modern society.

（5）Scientists prefer some typical sentence patterns and a large number of technical and semi-technical terms, which make EST different to a very wide extent from ordinary English.

Reading Material

Gravity Waves

Teams of scientists from around the world are hoping to be the first to observe gravity waves from space.

Albert Einstein first proposed the existence of gravity waves. He said that all things in the universe have a gravitational force on the matter and energy around them. The bigger an object and the closer it is, the greater its gravitational pull on other objects. Einstein said gravity waves fill the universe, moving through it like waves across an ocean. But they move at the speed of light, reducing and expanding the shape of time and space.

Only a truly huge event, such as the dying explosion of a great star, would give off gravity waves powerful enough ever to be measured on earth. This is because gravity waves on earth would change the distance between two points by less than the width of a tiny part of an atom.

Designing a device to observe and measure only tiny changes is very difficult. It must be able to block out all other influences-earth movements, changes in temperature, even the motion of air.

Scientists have developed two kinds of devices they believe can observe gravity waves. One such device is made from solid aluminum metal and built in the shape of a wide pipe. When a gravity wave strikes this device, the metal should make a sound like a bell.

No one has ever observed a gravity wave. In fact, no one has been able to prove that they even exist. But if they do exist, gravity waves could provide us with a great deal of information about objects in our universe that, until now have been impossible to observe.

Words and Expressions

1. gravitational [ˌgrˌviˈteiʃənəl] a. **引力的,重力的**
2. event [iˈvent] n. **事件**
3. tiny [ˈtaini] a. **微小的**
4. influence [ˈinfluəns] n. **影响**
5. aluminum [əˈluːminəm] n. **铝**

6. strike [straik] vt. **撞击**
7. gravity waves **引力波**
8. reducing and expanding **缩小和膨胀**
9. dying explosion **临终爆炸**
10. give off **释放**
11. block out **排除**
12. Albert Einstein **阿尔伯特·爱因斯坦**

Lesson 3

Probot for Tomorrow

Besides the decrease in price and increase in number, robots will also grow in sophistication. As memory chips become smaller and microprocessors become more advanced, the abilities of the probot will grow in number and usefulness, with more features appearing over the next few years①, such as:

Voice Recognition

The ability to detect words or phrases on which the probot may act. For instance, if you told your probot equipped with voice recognition "Get the newspaper", "Serve the drinks" or practically any other phrase, the probot could recognize it and follow your command②.

Advanced Robotics Arms

More advanced arms will become standard on most personal robots within the next decade. These arms, capable of more intricate movements and perhaps capable of "feeling" an object (with artificial skin) could make probots far more useful, since arms are probably their most vital working part③.

Space Exploration

Robots will not only help us on this world, but will also help us explore other worlds. In fact, space exploration is one of the most promising uses for robots, since these machines are not so susceptible to the elements that could hurt or kill people④.

Robots can withstand radiation, heat, cold, and can function without an atmosphere. Also, robots have a much longer life span, so voyages to other solar systems, as well as other planets, would be possible⑤. Robots could communicate with us, and if something went wrong and destroyed the space vehicle, a machine would be lost, not a human being.

These and many other new features will be introduced in robots and probots as they continue to evolve. We have seen the many uses for the robots of today, so the number of use for those of tomorrow seems almost too incredible to believe⑥.

New Words and Expressions

1. probot = personal robot n. **专用机器人**
2. sophistication [səˌfistiɾkeiʃən] n. **复杂化,完善,采用先进技术**
3. memory chip **存储芯片**
4. microprocessor [mɑikrəuɾprəusesə] n. **微处理机**
5. advanced [ədɾvɑːnst] a. **先进的**
6. feature [ɾfiːtʃə] n. **特色,特征**
7. recognition [rekəgɾniʃən] n. **识别**
8. practically [ɾpr⌊ktikəli] ad. **几乎;事实上**
9. recognize [ɾrekəgnɑiz] vt. **认可,承认**