



Subject-Based English

高等学校专业英语教材

电子技术专业 英语教程(第3版)

☆ 冯新宇 寇晓静 陈晓洁 主编 ☆



中国工信出版集团



电子工业出版社
PUBLISHING HOUSE OF ELECTRONICS INDUSTRY
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教材

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北京·BEIJING

内 容 简 介

本书从电子类相关专业入手,把电子、信息、电气、自动化、测控等相关专业的重点内容进行了整合,涵盖了电子及相关专业领域的主要分支。全书由16个单元组成,分别是英语翻译技巧、电子基础、半导体元器件、运算放大器、电源、电子仪器、线性电路分析、数字逻辑电路、集成电路、微型计算机、程序设计语言、通信网络技术、数字多媒体系统、电子系统、EDA工具、IC手册。从第2单元开始,每个单元都有几个主题,每个主题都包含课文、词汇、注释和练习。其中,课文着力体现了该单元的核心关键技术、国外优秀科技成果、前沿领域及未来前景等;练习包括 Keywords 和 Summary 两部分,培养学生归纳总结的能力。本书网上教学资源包括电子教案、授课建议、参考译文、练习参考答案及科技英语写作要求,读者可登录华信教育资源网 www.hxedu.com.cn 免费注册下载。

本书可作为高等院校电子技术等相关专业的专业英语教材,也可供从事相关专业的工程技术人员学习参考。

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前 言

专业英语教学的主要目的是指导学生阅读本专业及相关领域的英语书籍、文献,提高科技英语写作能力,使学生能以英语为工具获取相关的专业信息。本书根据第2版出版以来近4年的教学反馈再次进行修订而成,对过时的内容进行了删减,并增加了新的内容。新增加的内容除考虑了内容的时效性外,还考虑了专业英语授课的特殊性,借鉴同行优秀的教学方法,每个单元最后都增加了专业英语知识,书中原有经典章节继续保留,调整后的内容更适合本科层次专业英语教学。主要修订内容如下:删除 Reading Materials 部分共28篇课文,因为这部分内容在教学过程中使用不多,现在将其作为电子资料发布在互联网上,感兴趣的师生可以自行下载查看;开篇加入4个学时科技英语的翻译技巧,这些技巧在专业英语的授课中使用频率较高,老师响应也较好;从第2单元开始,每个单元都增加了“科技英语知识”,给枯燥的专业英语授课提供了素材,也达到了专业英语学习的目的,主要内容有数学符号及数学表达式的读法、形容词的翻译、英文书信、语法成分的转换、长句的翻译、专业英语词汇特点、专业英语概述、数词的翻译、名词的翻译、论文的标题和摘要、科技英语翻译标准、科技论文的结构与写作、动词的翻译、被动句的翻译、说明书常用术语等。

本书仍由16个单元组成,分别是英语翻译技巧、电子基础、半导体元器件、运算放大器、电源、电子仪器、线性电路分析、数字逻辑电路、集成电路、微型计算机、程序设计语言、通信网络技术、数字多媒体系统、电子系统、EDA工具、IC手册。从第2单元开始,每个单元都有几个主题,每个主题都包含课文、课文词汇、注释和练习。其中,课文着力体现了该单元的核心关键技术、国外优秀科技成果、前沿领域及未来前景等;练习包括 Keyword 和 Summary 两部分,培养学生归纳总结的能力。

本书由冯新宇主持制订编写大纲,对全书进行统稿,冯新宇、寇晓静、陈晓洁担任主编。其中,Unit 1由王蕴恒编写,Unit 2~4由陈晓洁编写,Unit 5~8由蒋洪波编写,Unit 9~10及15个单元的科技英语知识点由寇晓静编写,Unit 11~13由冯新宇编写,Unit 14~16单元由王娟编写。

在本书编写过程中,哈尔滨工业大学的张鹏楠、孙宇和黑龙江科技大学夏洪洋等老师对书稿的翻译进行了校准工作,在此表示感谢!

由于水平所限,书中难免有纰漏和欠妥之处,望读者不吝赐教。如有反馈意见,请发电子邮件至 123244441@qq.com。

编 者

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Unit 1 English-Chinese Translation Techniques

Lesson 1 Morphology in English-Chinese Translation

1. Differences between English and Chinese

English is a tree-like sentence structure language. An English sentence has a trunk bringing forth all the branches. The complexity of a sentence does not affect its trunk.

Example 1. **The use of heat pumps has been held back** largely by skepticism about advertiser's claims that heat pumps can provide as many as two units of thermal energy for each unit of electrical energy used, thus apparently contradicting the principle of energy conservation.

译文:热泵的使用受到阻碍主要是由于消费者对广告商宣称热泵消耗一个单位的电能可以提供两个单位的热能这种说法持怀疑态度而引起的,因为这显然同能量守恒原理相矛盾。

Example 2. **The computer performs a supervisory function** in the liquid-level control system by analyzing the process conditions against desired performance criteria and determining the changes in process variables to achieve optimum operation.

译文:在液位控制系统中,计算机执行着一种监控功能,它根据给定的特性指标来分析各种过程条件,并决定各过程变量的变化以获得最佳操纵。

Example 3. **There is no more difference**, but there is just the same kind of difference, between the mental operations of a man of science and those of an ordinary person, as there is between the operations and methods of a baker or of a butcher weighing out his goods in common scales, and the operations of a chemist in performing a difficult and complex analysis by means of his balance and finely graded weights.

译文:(没有什么更大的差别)科研人员的思考过程与普通人的思考过程的差别就等同于面包师或屠夫用普通的称称量商品与化学家用天平和精密砝码进行困难复杂的分析之间的差别。

A Chinese sentence has a bamboo-like structure with different sections linking one another, each one expressing a relatively complete semantic meaning independently.

Example 4. “碧云天,黄叶地,西风紧,北雁南飞。”

English grammar is expressed by conjunctions, relative pronouns and morphological changes. In Chinese, a variety of grammatical relations are implied in the context such as active and passive, tense.

Example 5. 我以为你回家了。I thought you had gone home.

Example 6. 工作做完了。The work has been finished.

2. Methods in English-Chinese translation

As a general criterion of translation, the translators should not add or reduce text content

at will. However, due to the big difference between English and Chinese, it is difficult to find corresponding word in the new text during the actual translation process. Therefore, in order to accurately express the original information, the translators often need to do some addition or subtraction of translation. So some people think, a good translation is generally slightly longer than the original — because the original author and the SL readers rarely have the language and cultural barriers, but the TL reader does not have such convenience, so translators often need to add the content implied in the original for the TL reader to understand easily.

1) Amplification in English-Chinese translation

Amplification in English-Chinese Translation is mainly for the consideration of Chinese expression, which includes amplification of words omitted from the original and adding the necessary connectives, quantifiers, or plural concept, or for the considered of rhetorical coherence, so that translation can conform to Chinese idiomatic expression.

(1) Amplification by supplying words omitted in the original

Example 7. Matter can be changed into energy, and energy into matter.

译文:物质可以转化为能,能也可以转化为物质。

Example 8. The best conductor has the least resistance and the poorest the greatest.

译文:最好的导体电阻最小,最差的导体电阻最大。

Example 9. A proton has a positive charge and an electron a negative charge, but a neutron has neither.

译文:质子带正电,电子带负电,而中子既不带正电也不带负电。

(2) Amplification by supplying necessary connectives

Example 10. Heated, water will change into vapor.

译文:水如受热,就会汽化。

Example 11. However carefully boiler casings and steam pipes are sealed, some heat escapes and is lost.

译文:不管锅炉壳与蒸汽管封闭得多么严密,还是有一部分热量散失并损耗掉。

Example 12. Since air has weight, it exerts force on any object immersed in it.

译文:因为空气具有重量,所以处在空气中的任何物体都会受到空气的作用力。

Example 13. The pointer of ampere meter moves from zero to five and goes back to two.

译文:安培表的指针先从0转到5,然后又回到2。

(3) Amplification by supplying words to convey the concept of plurality

Example 14. Note that the **words** “velocity” and “speed” require explanation.

译文:“速度”和“速率”这两个词需要解释。

Example 15. He stretched his **legs** which were scattered with **scars**.

译文:他伸出双腿,露出腿上的道道伤痕。

Example 16. The mountains began to throw their long blue **shadows** over the valley.

译文:群山开始向山谷投下一道道蔚蓝色长影。

(4) Amplification by supplying words to make an abstract concept clear

Example 17. **Oxidation** will make iron and steel rusty.

译文:氧化作用会使钢铁生锈。

Example 18. **This lack of resistance** in very cold metals may become useful in electronic computers.

译文:这种在甚低温金属中没有电阻的现象可能对电子计算机很有用处。

Example 19. After all **preparations** were made, the plane took off.

译文:一切准备工作就绪以后,飞机就起飞了。

(5) Amplification by logical thinking

Example 20. Air pressure **decreases** with altitude.

译文:气压随海拔的增加而下降。

Example 21. I was taught that **two sides of a triangle** were greater than the third.

译文:我学过,三角形的两边之和大于第三边。

Example 22. This shows that the resistance of an electric conductor is inversely proportional to its cross-section area.

译文:这表明,导体电阻的大小与导体横截面积的大小成反比。

(6) Amplification by supplying words of generalization

Example 23. According to scientists, it takes nature 500 years to create an inch of topsoil.

译文:根据科学家们的看法,自然界要用 500 年的时间才能形成一英寸厚的表层土壤。

Example 24. The thesis summed up the new achievements made in electronic computers, artificial satellites and rockets.

译文:该论文总结了电子计算机、人造卫星和火箭三方面的新成就。

Example 25. The principal functions that may be performed by vacuum tubes are rectification, amplification, oscillation, modulation, and detection.

译文:真空管的五大主要功能是整流、放大、振荡、调制和检波。

(7) Amplification by necessary repetition

Example 26. Avoid using this computer in **extreme** cold, heat, dust or humidity.

译文:过冷、过热、灰尘过重、湿度过大的情况下,不要使用此计算机。

Example 27. I had experienced oxygen and/or engine **trouble**.

译文:我曾经遇到的情况,不是氧气设备出故障,就是引擎出故障,或者两者皆有。

(8) Amplification by necessary modification

Example 28. They could sense **her (Titanic) mass, her eerie quiet and ruined splendor of a lost age.**

译文:他们体会到它(泰坦尼克号)船体的巨大,感受到它周围的可怕沉寂,领略到因岁月的流逝而造成的凄凉景观。

2) Omission in English-Chinese translation

In general, Chinese is more concise than English. In English-Chinese translation, if many indispensable words in the original are translated into Chinese word for word, they will become unnecessary verbiage. Translation would seem rather cumbersome. Therefore

omission is widely used in English-Chinese translation. Its main purpose is to delete some of the dispensable, unsuitable words for idiomatic expressions, such as omission of the substantives as pronouns, verbs and functional words as articles, prepositions, conjunctions, etc.

(1) Omission of the pronoun

Pronouns are more frequently used in English than in Chinese. Therefore, when translated into Chinese, many English pronouns may be omitted so as to conform the rendering to the accustomed usage of Chinese expression.

Example 29. Different metals differ in **their** conductivity.

译文:不同的金属导体的导电性不同。

Example 30. The current will blow the fuses when **it** reaches certain limit.

译文:当电流达到一定界限时会使熔丝熔断。

(2) Omission of the article

The article is the hallmark of English nouns. When translated into Chinese, it is usually omitted except when the indefinite article is intended to indicate the numeral "one", or "a certain".

Example 31. **The** controlled output is the process quantity being controlled.

译文:被控输出量是指被控的过程变量。

Example 32. Any substance is made up of atoms whether it is **a** solid, **a** liquid, or **a** gas.

译文:任何物质,不论是固体、液体还是气体,都由原子组成。

Example 33. The direction of **a** force can be represented by **an** arrow.

译文:力的方向可以用箭头表示。

(3) Omission of the preposition

Chinese is characterized by its succinctness and the preposition appears less frequently in Chinese than in English, and therefore omission of prepositions is a common practice in English-Chinese translation.

Example 34. The difference **between** the two machines consists in power.

译文:这两台机器的差别在于功率不同。

Example 35. Hydrogen is the lightest element **with** an atomic weight of 1.0008.

译文:氢是最轻的元素,原子量为 1.0008。

(4) Omission of the conjunction

Chinese is considered an analytic language and many conjunctions that are indispensable in English may seem redundant in Chinese. Therefore, omission of the conjunction is a common practice in English-Chinese translation.

Example 36. **If** I had known it, I would not have joined in it.

译文:早知如此,我就不参加了。

Example 37. Like charges repel each other **while** opposite charges attract.

译文:同性电荷相斥,异性电荷相吸。

(5) Omission of the verb

As Chinese is a language of parataxis, its grammar is not so strict as that of English, and

predicative verbs in Chinese sometimes may also be omitted.

Example 38. When the pressure **gets** low, the boiling point **becomes** low.

译文:气压低,沸点就低。

Example 39. Solids expand and contract as liquids and gases **do**.

译文:如同液体和气体一样,固体也能膨胀和收缩。

Example 40. For this reason television signals **have** a short range.

译文:因此,电视信号的传播距离很短。

(6) Omission of the impersonal pronoun "it"

Example 41. This formula makes **it** easy to determine the wavelength of sounds.

译文:这一公式使得测定声音的波长十分简单。

Example 42. **It** was not until the middle of the 19th century that the blast furnace came into use.

译文:直到19世纪中叶,高炉才开始使用。

3) Conversion in English-Chinese translation

(1) Conversion into verb

One of the most remarkable differences between English and Chinese syntax is the use of the verb. It is taken for granted that an English sentence contains no more than one predicate verb, while in Chinese it is not unusual to have clusters of verbs in a simple sentence. Take the following sentence for example.

Example 43. Families upstairs have to carry pails to the hydrant downstairs for water.

译文:住在楼上的人家得提着水桶去楼下的水龙头处打水。

Four verbs are clustered in the Chinese version for an English simple sentence. This indicates obviously that in English-Chinese translation the conversion of English words of various parts of speech into Chinese verbs is a matter of common occurrence.

① Nouns converted into verbs

Example 44. Rockets have found **application** for the **exploration** of the universe.

译文:火箭用于探索宇宙。

Example 45. The **sight** and **sound** of our jet planes filled me with special longing.

译文:看到我们的喷气式飞机,听见隆隆的声音,我心驰神往。

② Prepositions converted into verbs

Example 46. A force is needed to move an object **against** inertia.

译文:为使物体克服惯性而运动,就需要一个力。

Example 47. Noise figure is minimized **by** a parameter amplifier.

译文:采用参数放大器可将噪声指数降到最低。

③ Adjectives converted into verbs

Example 48. Both of the substances are **soluble** in water.

译文:这两种物质都能溶于水。

Example 49. If low-cost power becomes **available** from nuclear power plants, the electricity crisis would be solved.

译文:如果能从核电站获得低成本电力,就会解决电力紧张问题。

④ Adverbs converted into verbs

Example 50. When the switch is **off**, the circuit is open and electricity doesn't go through.

译文:当开关断开时,电路就形成开路,电流不能通过。

Example 51. In this case the temperature in the furnace is **up**.

译文:这种情况下,炉温就升高。

(2) Conversion into nouns

Nouns account for an overwhelming part of the vocabulary both in Chinese and in English. Conversion between nouns and other parts of speech is also frequently adopted in English-Chinese translation.

① Verbs converted into nouns

Some verbs that are derived from nouns can hardly be translated literally so they are usually converted into nouns.

Example 52. Such materials are **characterized** by good insulation and high resistance to wear.

译文:这些材料的特点是:绝缘性好,耐磨性强。

Example 53. The design **aims** at automatic operation, easy regulation, simple maintenance and high productivity.

译文:设计的目的在于自动工作、调节方便、维护简易、生产率高。

② Adjectives converted into nouns

Adjectives with the definite articles to indicate categories of people, things, or adjectives used as predicative to indicate the nature of things may also be converted into nouns.

Example 54. Both the compounds are acids, **the former** is strong, **the latter** weak.

译文:这两种化合物都是酸,前者是强酸,后者是弱酸。

Example 55. In the fission process the fission fragments are very **radioactive**.

译文:在裂变过程中,裂变碎片具有强烈的放射性。

Example 56. IPC is more **reliable** than common computer.

译文:工控机的可靠性比普通计算机高。

③ Pronouns converted into nouns

English pronouns are more frequently used than Chinese pronouns. In order to make clear what they really refer to, we sometimes have to convert them into nouns, i. e., to repeat the nouns that they stand for.

Example 57. Radio waves are similar to light waves except that **their** wavelength is much greater.

译文:无线电波与光波相似,但无线电波的波长要长得多。

Example 58. The specific resistance of iron is not so small as **that** of copper.

译文:铁的电阻系数不如铜的电阻系数那样小。

Example 59. The result of this experiment is much better than **those** of previous ones.

译文:这次实验的结果比前几次的**实验结果**好得多。

Example 60. Experiment indicates that the new chip is about 2 times as integrative as **that** of the old ones.

译文:实验表明新型芯片的集成度是旧型芯片**集成度**的2倍。

(3) Conversion into adjectives

In English-Chinese translation there are some circumstances in which various other parts of speech in English can be converted into Chinese adjectives.

① Nouns converted into adjectives

Example 61. This experiment was a **success**.

译文:这个实验很**成功**。

② Adverbs converted into adjectives

Example 62. Earthquakes are **closely** related to faulting.

译文:地震与地层断裂有**密切**的关系。

Example 63. It is demonstrated that gases are **perfectly** elastic.

译文:人们已经证实,气体具有**理想**的弹性。

Example 64. The pressure **inside** equals the pressure **outside**.

译文:**内部**的压力和**外部**的压力相等。

(4) Conversion into adverbs

Sometimes, for the sake of convenience, some parts of speech in English may be converted into Chinese adverbs in English-Chinese translation.

Example 65. Below 4°C, water is in **continuous** expansion instead of **continuous** contraction.

译文:水在4°C以下就会**不断地**膨胀,而不是**不断地**收缩。

Example 66. Rapid evaporation at the heating-surface **tends** to make the steam wet.

译文:加热面上的迅速蒸发,**往往**使水蒸气的湿度变大。

Example 67. The **same** principles of low internal resistance also apply to milliammeters.

译文:低内阻原理也**同样**适用于毫安表。

(5) Conversion of sentence elements

Conversion in a broader sense includes the conversion of the “active voice” into the “passive”. Sometimes, it may involve the change of various elements of a sentence, such as from the subject to the object, and vice versa.

Example 68. As the match burns, **heat and light** are given off. (from the subject to the object)

译文:火柴燃烧时发出**光和热**。(从主语到宾语)

Example 69. This sort of stone has a **relative** density of 2.7. (from the object to the subject)

译文:这种石头的**相对密度**是2.7。(从宾语到主语)

Example 70. **Care** must be taken at all times to protect the instrument from dust and

damp. (from the subject to the predicate)

译文:应当始终注意保护仪器,不使其沾染灰尘和受潮。(从主语到谓语)

Example 71. Fuzzy control **is found** a effective way to control the systems without precise mathematic models.

译文:人们发现,模糊控制是一种控制不具备精确数学模型系统的有效方法。(从被动到主动)

4) Restructuring in English-Chinese translation

(1) Different sequences in customary word combinations

Every nation has its own unique ways of combining words, and so are the English and Chinese.

Example 72. Phase: heart-warming, tough-minded, East China, north and south, east and west, share the weal and woe, rain or shine, inconsistency of deeds with words, the iron and steel industry, quick of eye and deft of hand, food, clothing, shelter and transportation, you, he and I, back and forth, to and fro, every means possible.

译文:短语:暖人心的,意志坚定的,华东,东南西北,祸福与共,无论晴雨,言行不一,钢铁工业,手疾眼快,衣食住行,你我他,前前后后,来来去去,一切可能的手段。

Example 73. Connect the black pigtail with the dog-house.

译文:把黑色的猪尾巴系在狗窝上。(错误)

译文:将黑色的引出线接在高频高压电源屏蔽罩上。(正确)

Example 74. Outside it was pitch-dark and it was raining cats and dogs.

译文:外面一片漆黑,大雨倾盆。

(2) Different sequences in customary sentence arrangement

English sentences are generally bound by syntactical rules, and they are often arranged in order of importance, while Chinese sentences are more flexible, and usually arranged according to the sequence of time.

Example 75. Rocket research **has confirmed a strange fact** which had already been suspected: there is a "high-temperature belt" in the atmosphere, with its center roughly thirty miles above the ground.

译文:人们早就怀疑大气层中有一个“高温带”,其中心在距地面约 30 英里高的地方。利用火箭加以研究后,这一奇异的事实已得到了证实。

Example 76. **We had been dismayed** at home while reading of the natural calamities that followed one another for three years after we left China in 1959.

译文:我们于 1959 年离开了中国。此后,中国连续三年遭到自然灾害。当我们在国外读到这方面的消息时,心情颇为沉重。

(3) Adverbial clauses in a complex sentence

Adverbial clauses of condition, purpose, concession or cause, and so on in English may stand either before or after a principal clause, however, when translated into Chinese, they are normally placed before the principal clause.

Example 77. The government is determined to keep up the pressure **whatever the cost it will pay in the end.**

译文:不论最终将付出什么代价,政府都决心继续施加压力。

Example 78. **No matter how hard she tried**, she failed at last.

译文:不管她怎样努力,最后还是没有成功。

(4) “That-” clause used as a judgment or conclusion

“That” clause is usually adopted in expressing a judgment or conclusion. When a “that” clause which serves as the subject (of a sentence or a clause) is too long and consequently “it” is simultaneously used as the “formal subject”, restructuring is often called for, so as to conform to the Chinese usage.

Example 79. **It is not surprising that**, when humidity is low, the water evaporates rapidly from the fruit.

译文:在大气湿度低的情况下,水果里的水分蒸发就快,这是不足为奇的。

Example 80. **It is common practice that** electric wires are made from copper.

译文:电线是铜制的,这是常见的做法。

Example 81. A few years ago **it was thought unbelievable that** the computer could have so high speed as well so small volume.

译文:几年前人们还认为计算机能具有如此高的运行速度和如此小的体积是一件难以置信的事。

Lesson 2 Syntax in English-Chinese Translation

Due to extensive use of attributive clause, adverbial clause and a variety of phrases, English sentences often have longer complex structures. In addition, because of the differences between English and Chinese in the morphology, syntax, logical thinking and so on, it is difficult to understand and translate long sentences.

1. Translation techniques

The tree-like sentence structure of English is converted into the Chinese bamboo-like sentence structure: a long sentence is divided into pieces, so some necessary changes are needed to make them relatively independent and complete. A few relatively independent sentences are rearranged in accordance with Chinese custom, that is in the chronological order, then in the logical order from the conditions to the results.

Example 1. The newly described languages were often so strikingly different from the well studied languages of Europe and Southeast Asia that some scholars even accused Boas and Sapir of fabricating their data.

译文:这些新描述的语言与人们充分研究过的欧洲与东南亚的语言截然不同,以至于有些学者指责 Boas 与 Sapir 伪造资料。

Example 2. No such limitation is placed on an AC motor; here the only requirement is