



全国高等职业教育规划教材

电子信息技术专业英语

第2版

主编 丁宁 汤滢

ELECTRONIC INFORMATION TECHNOLOGY

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机械工业出版社
CHINA MACHINE PRESS

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主编 丁宁 汤滢

参编 李晓莲 龚美霞 何嫻



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本书主要分为电子学、计算机、通信与信息处理、电子信息新技术的选读内容、专业英语的实训内容 5 大部分。电子学部分主要介绍了基本的电物理量、半导体、集成电路、放大器、数字电路、仪器仪表知识；计算机部分主要介绍了计算机基础知识、网络知识、计算机安装使用手册、Microsoft Office 2003、多媒体、ISDN；通信与信息处理部分主要介绍了信号、编码技术、通信系统、传输模式以及信号的处理等；电子信息新技术的选读部分主要介绍了数字电视、视频点播、GPS 全球定位系统、ZigBee 技术、3G 技术、光纤通信、软件无线电、遥感、传感器以及 RFID、物联网等热门技术。专业实训内容包括国外专业网站浏览和仪表面板英文标注学习。另外，本书还配备了与课文相关的练习试卷和参考译文、练习答案、课件等内容。

本书内容由浅入深、选材广泛、通俗易懂、形式多样，适合高职高专电子信息类和通信类专业的学生使用。

图书在版编目 (CIP) 数据

电子信息技术专业英语 / 丁宁, 汤滢主编. —2 版. —北京: 机械工业出版社, 2012.4

全国高等职业教育规划教材

ISBN 978-7-111-37504-3

I. ①电… II. ①丁… ②汤… III. ①电子技术—英语—高等职业教育—教材 IV. ①H31

中国版本图书馆 CIP 数据核字 (2012) 第 025169 号

机械工业出版社 (北京市百万庄大街 22 号 邮政编码 100037)

责任编辑: 王 颖

责任印制: 李 妍

中国农业出版社印刷厂印刷

2012 年 5 月第 2 版·第 1 次印刷

184mm×260mm·12.25 印张·303 千字

0001—3000 册

标准书号: ISBN 978-7-111-37504-3

定价: 25.00 元

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出版说明

根据《教育部关于以就业为导向深化高等职业教育改革的若干意见》中提出的高等职业院校必须把培养学生动手能力、实践能力和可持续发展能力放在突出的地位,促进学生技能的培养,以及教材内容要紧密结合生产实际,并注意及时跟踪先进技术的发展等指导精神,机械工业出版社组织全国近 60 所高等职业院校的骨干教师对在 2001 年出版的“面向 21 世纪高职高专系列教材”进行了全面的修订和增补,并更名为“全国高等职业教育规划教材”。

本系列教材是由高职高专计算机专业、电子技术专业和机电专业教材编委会分别会同各高职高专院校的一线骨干教师,针对相关专业的课程设置,融合教学中的实践经验,同时吸收高等职业教育改革的成果而编写完成的,具有“定位准确、注重能力、内容创新、结构合理和叙述通俗”的编写特色。在几年的教学实践中,本系列教材获得了较高的评价,并有多品种被评为普通高等教育“十一五”国家级规划教材。在修订和增补过程中,除了保持原有特色外,针对课程的不同性质采取了不同的优化措施。其中,核心基础课的教材在保持扎实的理论基础的同时,增加了实训和习题;实践性较强的课程强调理论与实训紧密结合;涉及实用技术的课程则在教材中引入了最新的知识、技术、工艺和方法。同时,根据实际教学的需要对部分课程进行了整合。

归纳起来,本系列教材具有以下特点:

- 1) 围绕培养学生的职业技能这条主线来设计教材的结构、内容和形式。
- 2) 合理安排基础知识和实践知识的比例。基础知识以“必需、够用”为度,强调专业技术应用能力的训练,适当增加实训环节。
- 3) 符合高职学生的学习特点和认知规律。对基本理论和方法的论述要容易理解、清晰简洁,多用图表来表达信息;增加相关技术在生产中的应用实例,引导学生主动学习。
- 4) 教材内容紧随技术和经济的发展而更新,及时将新知识、新技术、新工艺和新案例等引入教材。同时注重吸收最新的教学理念,并积极支持新专业的教材建设。
- 5) 注重立体化教材建设。通过主教材、电子教案、配套素材光盘、实训指导和习题及解答等教学资源的有机结合,提高教学服务水平,为高素质技能型人才的培养创造良好的条件。

由于我国高等职业教育改革和发展的速度很快,加之我们的水平和经验有限,因此在教材的编写和出版过程中难免出现问题和错误。我们恳请使用这套教材的师生及时向我们反馈质量信息,以利于我们今后不断提高教材的出版质量,为广大师生提供更多、更适用的教材。

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前 言

随着现代科学技术的迅猛发展,国际化的技术交流和经济合作日益频繁,高等职业教育的教学思想与教学模式也在根据市场的需求而不断变革。这就要求高职教材必须进行与之配套的调整,切实提高学生的职业技术能力,培养出适应社会发展的综合技能型人才。

根据当今就业市场的需要,行业设置的专业形形色色、更加细化,常见的电子类专业有:电子信息技术专业、应用电子技术专业、无线电技术专业、通信技术专业、仪器仪表专业、微波技术专业等,这些专业虽各具特色,但都隶属于电子类相关专业,具有一定的关联性。而且,随着近些年来高等职业教育的规模不断扩大,电子类专业越来越成为热门专业而受到人们的青睐,外资企业成为大多数毕业生就业的首选,这就形成了一个英语电子技术人才需求的巨大市场。2005年编者编写的《电子信息技术专业英语》教材(机械工业出版社出版)适应了这一市场的需求,教材已经销往全国十几个城市的各大书店和高职院校,总计销量2万余册。应读者的要求,编者根据近年来的反馈意见和教学经验,结合现代电子技术的最新发展趋势,对《电子信息技术专业英语》一书进行了改版。改版后进一步突出了高等职业教育的实用特点,更加重视技能训练,与新技术结合紧密,插图也更加丰富。具体特点如下:

- 课文的取材多选自原版的专业资料和国外的专业网站,语句原汁原味,不仅表达简练、顺畅、纯正,而且具有一定的趣味性,易于阅读和理解。
- 课文的内容涉及电子技术基础、仪器仪表、计算机、通信方面的知识,通信章节的编排更加完善——从信号、信号的调制与解调、编码、通信系统到信息处理,基本覆盖了当代电子信息技术的各个领域。同时,收录了一些电子信息新技术发展前沿方面的文章作为选读课文。改版教材增加了如视频点播、ZigBee技术、3G、遥感、传感器、RFID等最新技术。
- 课文内容丰富、题材广泛、通俗易懂,可以满足不同层次的教学要求。另外,改版教材的最后设置了专业英语的实训内容,包括英文标注的仪表使用训练以及国外专业技术网站浏览技能训练,强化了教材的实用技能。
- 在每篇课文之前,首先提供与课文内容相关的讨论问题,以使学生对课文知识有所了解,更主要的目的是给学生更多发挥想象的空间,并营造以学生为主体的教学环境,促进学生自主学习。
- 课文中穿插了专业英语技能的学习环节,包括专业英语的词汇和语法学习介绍,原版产品技术说明书和维修手册以及与公司面试相关的系列技能训练,有针对性地培养学生的实用技能。
- 本书还配有一些实用专业英语会话,通过口语练习,使学生能够在专业技术方面运用英语进行简单交流,避免专业英语教学中普遍存在的哑巴英语现象,提高专业人才的沟通技能和综合素质,以适应国际经济发展的需要。
- 本书的附录部分不仅配有课文的翻译,还介绍了大公司的机构名称、世界著名电子信息类公司、电类工厂名称等,以改变学生对公司、企业缺乏了解的现状。
- 使用本书时,建议每课安排4学时。考虑到具体的教学安排和教学对象,教师可根据需要对书中内容进行取舍。

本书由南京信息职业技术学院的丁宁副教授、汤滢讲师担任主编，负责编写书中各部分内容，并统编全稿；南京信息职业技术学院成教院的李晓莲老师、南京信息职业技术学院龚美霞老师、江苏海事职业技术学院何娴老师参与了本书的部分具体实施工作，并对本书提出了许多宝贵的修改意见。本书在编写过程中还得到院领导于宝明教授的关心和支持。在此，对所有指导和帮助过本书出版的朋友表示深深的敬意和感谢。

由于编者水平有限，时间仓促，书中难免存在不足之处。恳请教师、同学和广大读者批评指正。

编 者

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Part One Electronics

Unit 1 Electronic Components

Preparing for the text

Technical terms

electronic equipment	电子设备
electronic circuits	电子电路
electrical energy	电能
variable resistors	可调电阻
alternating currents	交流电
direct currents	直流电
non-conducting material	绝缘体

Questions for text discussion

- What component can restrict the flow of electrons ?
- What component can be used to change AC into DC?
- What component can amplify small signal ?



TEXT

The circuits inside pieces of electronic equipment are a bit like cities : they're packed with components (similar to buildings) that do different jobs and the components are linked together by cables or printed metal connections (similar to streets).^[1] Unlike in a city, where virtually every building is unique and even two supposedly identical homes or office blocks may be subtly different, electronic circuits are composed of a small number of standard components. But, just like LEGO®(乐高玩具), you can put these components together in an infinite number of different places so they do an infinite number of different jobs.

These are some of the most important components you'll encounter.

• Resistors

These are the simplest components in any circuit. Their job is to restrict the flow of electrons and reduce the current or voltage flowing by converting electrical energy into heat. Resistors come in many different shapes and sizes. Variable resistors (also known as potentiometers) have a dial control on them so they change the amount of resistance when you turn them. Volume controls in

audio equipment use variable resistors like these.

- **Capacitors**



These relatively simple components consist of two pieces of conducting material (such as metal) separated by a non-conducting (insulating) material called a dielectric. They are often used as timing devices, but they can transform electrical currents in other ways too. In a radio, one of the most important jobs, tuning into the station you want to listen to, is done by a capacitor.

- **Diodes**



The electronic equivalents of one-way streets, diodes allow an electric current to flow through them in only one direction. They are also known as rectifiers. Diodes can be used to change alternating currents (ones flowing back and forth round a circuit, constantly swapping direction) into direct currents (ones that always flow in the same direction).

- **Transistors**



Easily the most important components in computers, transistors can switch tiny electric currents on and off or amplify them (transform small electric currents into much larger ones). Transistors that work as switches act as the memories in computers, while transistors working as amplifiers boost the volume of sounds in hearing aids. When transistors are connected together, they make devices called logic gates that can carry out very basic forms of decision making.

New words

1. component [kəm'pəʊnənt] *n.* 元件
2. circuit ['sə:kit] *n.* 电路
3. equipment [i'kwipmənt] *n.* 设备
4. infinite ['ɪnɪtɪt] *adj.* 无限的
5. encounter [ɪn'kaʊntə] *vt.* 遇到
6. resistor [ri'zɪstə] *n.* 电阻
7. capacitor [kə'pæsɪtə] *n.* 电容
8. dielectric [daɪ'ɪlektɪk] *n.* 绝缘体
9. separate ['sepəreɪt] *v.* 分开
10. current ['kʌrənt] *n.* 电流
11. transistor [træn'sɪstə] *n.* 晶体管
12. amplifier ['æmplɪfaɪə] *n.* 放大器

Expressions

be composed of	由……组成的
be known as	被称做……
consist of	由……组成的
act as	用做……

Notes to the text

[1] they're packed with components (similar to buildings) that do different jobs and the components are linked together by cables or printed metal connections (similar to streets).

电路由元器件构建（元器件类似于城市的建筑物），不同的元器件有着不同的作用，通过导线、印制电路板走线（类似于街道）可以将这些元器件连接在一起。

这里 that do different jobs 为定语从句，修饰先行词 components。

Exercises

1. Translate the following phrases and expressions.

- (1) 电路中最简单的元件。
- (2) 电能转换成热能。
- (3) flow in only one direction.
- (4) 通、断开关。
- (5) insulating material called a dielectric.

2. Fill in the blanks with the words given below.

circuit current transistors conductors charge

- (1) The job of resistor is to reduce the _____ flowing.
- (2) Alternating currents are ones flowing back and forth round a _____.
- (3) The electric field always does positive work on the _____.
- (4) Semiconductors are neither good _____ nor good insulators(绝缘体).
- (5) _____ that work as switches act as the memories in computers.

3. Tell what the underlined words mean here.

(1) Matter is made up of atoms, which are composed of a number of fundamental (基本的) particles(粒子).

(2) As an example, we may produce a negative charge on a balloon (气球) by rubbing (摩擦) it against our hair.

(3) The unit of voltage, or potential difference, as it is sometimes called, is the volt(V).

(4) The balloon will then stick to a wall or the ceiling, which are uncharged.

(5) We now define the coulomb(C) by stating that the charge of an electron is a negative one of 1.60218×10^{-19} coulombs. Putting it another way, a coulomb (库仑) is the charge of about 6.24×10^{18} electrons.

4. Choose the appropriate words or expressions to fill in the blanks.

(1) The switch, resistor (电阻) and wire _____ (are composed of, constitute) a circuit.

(2) A computer _____ (consists of, makes up) an input/output(I/O) device, a memory, a control section, and an arithmetic(算数的) and logic unit.

(3) A molecule(分子) of water _____ (is composed of, composes) three atoms—two of hydrogen (氢) and one of oxygen.

(4) The flow of electrons _____ (is made up of, makes up) electric current.

(5) The lines of flux(磁力线) which _____ (are made up of, constitute) the magnetic field cut across the wire.

5. Translate the following sentences into English.

(1) 电阻可以阻碍电流的流动。

(2) 电容是由两块金属隔以绝缘物质组成的。

(3) 晶体管的作用类似一个开关。



Reading

Current and Voltage

Part of the reason why electricity seems so mystifying (神奇) is because you can't see it. But such things as voltage, current, etc can be explained by imagining electricity in cables as if it was water flowing in a pipe. Voltage is the "pressure of electricity", and Current is the flow-rate.

Voltage is potential, like a head of steam, a static pressure of electricity waiting to flow.

Current is measured in AMPS. If electrons are the atoms of electricity, you'd see six million million million of them flow per second for each amp of current there is. (electrons are very small - many household appliances (家用电器) have several amps as a working current).

You can spot the electricians, as they talk about a voltage that there is, but talk about a current that flows through something.

Power is easy to work out, as it's voltage multiplied by current. It's like hydroelectric(水力发电的) power stations having a power which is the voltage (height) of water x the current (amount of water flowing). The standard power socket (插座) in the UK is 240 volts, and can supply up to 13 amps. So, the maximum power is $240 \times 13 = 3,120$ Watts. A three kilowatt electric fire is at the limit of what can be plugged into a single socket.

Similarly, you can turn this around and work out that a 100 watt bulb requires a current of 100 divided by $240 = 0.4$ amps.

But on electricity bills you don't pay for power, you pay for energy. Again, there is an easy relationship for working these things out. Energy is power x time. A one kilowatt (1 000W) heater running for one hour has used one kilowatt-hour. A kilowatt-hour costs about 7p (2001) generally, but is cheaper at night. You can always work out these things scientifically; for example a fridge with a power of 100 watts, in ten hours uses one kilowatt-hour.

Skill Learning

科技英语的特点

科技文体 (Scientific writing) 有其独特的语体, 这是由科学技术本身的性质所决定的。

它与普通英语相比具有如下特点。

一、无人称 (*Impersonal*)

科技文体第一个显著的特点就是句子往往没有人称代词,即所谓的无人称句。科技文章描述和讨论的大多是科学发现或科技事实。尽管科技活动系人类所为,但由于科技文章所报告的主要是这种科技活动的结果或自然规律,而不是报告这些结果或自然规律是由谁发现或完成的,因此,大多数科技文章很少使用有人称的句子。

例如: The junction transistor is the most widely used active device in present-day electronic circuits.

结型晶体管是当前电子线路中使用最广泛的有源器件。

An important function of NOT gate is to produce an output signal that is opposite in nature to the input signal.

非门的重要功能是产生与输入相反的输出。

需要说明的是,无人称不是绝对的。有时由于行文等的需要,也使用人称代词,但总的来说,人称句在科技文章中的比例是很小的。

例如: One might therefore expect its electrical behavior to be similar to that of two junction diodes connected back-to-back.

也许因此有人认为它的电特性类似于两个背靠背连接的结型二极管。

二、语气正式 (*Formal in speech*)

由于人们对待科技活动的态度向来十分严肃,所以科技文章在用词和语气上也较正式。

例如: It is a three-terminal device which exploits the properties of P-N junctions.

它是一种利用 P-N 结特性的三端器件。

By directivity is meant the ability of the microphone to pick up sounds from various directions.

所谓方向性,指的就是传声器从各个方向接受声音的能力。

在前一个例句中就使用了比较正式的书面用语 “exploit”, 而没有使用较常见的一般用语 “use”。在后一个例句中则用了一个固定句式,即一个部分倒装句型,使语气显得比较正式。

三、陈述客观、准确 (*Objective and accurate in statement*)

由于科技文章是反映客观事物的,所以对科技文章作者的基本要求就是在文章中不能掺杂个人的主观意识,对客观事物的陈述必须客观、准确。定性讨论客观、定量分析准确是科技文章的显著特征之一。

例如: In a wire through which an electric current flows, the electrical power that is changed into heat is commonly called the power loss in the wire, and the difference of potential across the terminals of the wire is called the voltage drop in the wire.

导线中电流流过时转变为热能的电功率通常称为导线的功耗,而导线两端的电势差称为导线的压降。

The farad is the capacitance of a capacitor with a potential difference of one volt when it is charged with a charge of one coulomb.

法拉是指当一个电容器两端电位差为 1 伏特且充有 1 库仑的电荷量时的电容值。

四、文体简洁 (*Concise in stylistics*)

科技文章和文学作品的不同之处还在于其在语句的简洁。文学作品富于美学修辞，辞藻华丽，而科技文章则以交际修辞为主，文风质朴，语句长，但文理清晰，强调语言的统一性和连贯性。

例如：The coil on which the current is impressed on the input side of the transformer is called the primary, while the one from which the induced current is obtained on the output side is called the secondary.

在变压器的输入端加上电流的线圈称为初级线圈，而在输出端获得感应电流的线圈称为次级线圈。

On account of the accuracy and ease with which resistance measurements may be made and well-known manner in which resistance varies with temperature, it is common to use this variation to indicate changes in temperature.

电阻的大小是随温度而变化的，用电阻进行测量既精确又方便，因此通常都用电阻的变化来表示温度的变化。

五、逻辑性强 (*Strict in logic*)

科技文章的又一个突出的特征是逻辑性强。虽然逻辑是非语言因素，但能通过其来判断一篇科技文章是否具有科学性。科技文章的清晰概念、合理判断、严密推理等，都要求作者有很强的逻辑性来行文布局。

例如：The resistance of a wire is directly proportional to its length, inversely proportional to its cross-section, and directly proportional to the resistivity of the substance forming the wire.

导线的电阻与其长度成正比，与其横截面面积成反比，并且与组成导线的物质的电阻系数成正比。

Because the primary and secondary windings do not occupy exactly the same space, some of the flux that, links one winding does not link the other winding so that the e.m.f. per turn of the two windings are not exactly the same.

由于初级、次级绕组占据的空间并非完全相等，所以一绕组中有一部分磁通量并不穿过另一绕组，从而两绕组各匝的电动势也不完全相同。

六、专业术语性强 (*Concentrated in technical terms*)

由于专业术语具有单义性和简洁性的特点，所以在科技文章中有大量的专业术语。对于科技人员来说，专业术语就是该专业的基础语言，而对于那些不从事该专业的人来说则很难理解。因此，科技文章的较强专业术语性是区别一般性文章的重要特征。

例如：The most obvious advantage is that the oscilloscope shows waveform, frequency and phase simultaneously with the amplitude of the voltage (or current) being measured.