21世纪高职高专规划教材

高等职业教育规划教材编委会专家审定

DIANZI JISHU ZHUANYE YINGYU

电子技术专业英语

主　编　周国娟　金红莉
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内 容 简 介

本书涉及电子元器件、仪器仪表、集成电路、数据手册、电子应用、EDA 软件、3G 通信和微机等专业英语资料。书中还介绍了专业英语的基础知识、翻译技巧、应用文体等内容，为读者系统了解、掌握并熟练运用专业英语奠定基础。在书的后面附有译文、电子类专业词汇、EDA 软件菜单的中英文对照、参考答案和专业词汇索引，便于读者查阅。

本书可作为各类高等职业院校电子信息技术专业及相关专业的英语教材，也可供相关技术人员参考。

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前　言

电子信息技术已渗透到人们工作和生活的各个方面。社会对专业人才的英语水平要求也越来越高，电子信息英语也随之独立成为一门专业外语，并在电子信息技术应用中发挥巨大的交流作用。一个电子信息方面的人才除了要掌握电子信息科学的基本理论和技能外，更重要的是具备快速获取新的信息科学方面知识的能力。而电子信息英语（尤其是阅读能力）则是体现这种能力的一个重要方面。

本着使学生在学完基础英语之后能掌握本专业相关的科技英语词汇，掌握科技英语的构词法、句法特点及翻译、理解技巧，提高阅读、翻译和理解专业英语资料的能力的宗旨，本书在结构、内容安排等方面，吸收了电子信息行业部分工程人员的工作经验和编者在教学改革、教材建设等方面的经验，结合电子技术专业知识和科技英语基本翻译、阅读方法，力求体现高等职业教育的实用性特点，内容选取与新技术紧密结合，满足当前教学改革的需要。

本教材内容共包含 10 个单元，每一个单元为一个学习情境，按照难易程度依次递进的思路设计的。并结合专业、实际的器件、仪器、电路、应用来进行组织。让学生在专业英文资料的阅读中去了解器件特点、仪器使用、电路设计和实际应用；在应用中来加强对专业词汇的掌握、英文资料的翻译和理解能力。通过对不用的学习情境的学习，反复训练，培养学生阅读并理解简单专业英语资料的能力；培养简单的专业英语交流的能力；能借助词典阅读中等难度的英文专业资料，并正确理解和翻译；拓展学生运用英语进行交际的范围和继续学习的能力。

在教学过程中，我们了解到学生在学完“大学英语”课程后，虽然已具有一定的英语阅读能力，但在阅读专业英语时还会遇到不少困难。主要原因有：对专业英语词汇不熟悉，专业资料接触太少，不熟悉英语科技文章的结构和体裁。针对学生遇到的这些困难，我们在编写过程中力求体现下列特点。

（1）易读性：本书的取材多选自专业资料，语句原味，不仅表达简练、顺畅、纯正，而且具有一定的趣味性，有较强的可读性和易读性。

（2）目标明确：在每单元课文之前，确定了本单元的知识目标和能力目标，提供了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，更主要的是给学生更多的发挥想象的空间，并营造以学生为主体的教学环境，促进学生的自主学习。

（3）图文并茂：本书加入了大量的真实的照片，来加深学生对实际的器件、仪器、设备、产品、软件等的感性认识，加深理解。

（4）教学做一体：根据高职的教育目标和高职学生特点，本着实用的原则，本教材针对实际的器件、仪器、设备、产品、软件等而设计的，在教学过程中可结合实物来实施教学，边讲解、边操作、边学习、边理解，来实现教学做一体，以适应教学改革的需要，提高教学效果。

(5) 注重应用:以电子技术专业英语的应用为主线,每个单元均针对本单元的英语资料设计了“具体应用”来进行实际操作,使学生在阅读完专业英语资料后能根据所得信息进行应用,让学生实际动手去做,在做中学。大大地提高了学生的学习兴趣。使学生在学习过程中不会感到枯燥、乏味。

本书内容共分 10 个单元,每个单元包括课文、专业词汇、阅读材料、翻译知识、应用能力和拓展练习。在书的最后附有译文、电子类词汇、EDA 软件菜单中英文对照、课后练习参考答案,便于学生学习巩固。考虑到具体的教学安排和教学对象,教师可根据需要对教材内容进行取舍。

本书主编周国娟、金红莉,副主编苏福根、吕殿基,参编吴新杰、熊国灿。审稿付丽琴教授、吕殿基副教授。

限于编者的学识水平与实践经验,书中不足之处在所难免,恳请广大读者批评指正。主编邮箱:zhouguojuan2004@163.com。

编　者

Contents

Unit 1 Introduction

Knowledge aims:

1. Technology English characteristics.
2. Translation skills.
3. Understand the electronic technology.

Ability aims:

Can translate the professional literature.

Pre-reading

Read the following passage, paying attention to the questions.

1. Who invented the transistor?
2. What courses should a student majoring in electronics study?
3. What career will a student majoring in electronic technology follow?

1.1 Text

1.1.1 History about Electronics

Fifties and sixties in the 20th century, the most representative of the advanced electronic technology is wireless technology, including radio broadcasting, radio, wireless communications (telegraph), amateur radio, radio positioning, navigation and other telemetry, remote control, remote technology. Early that these electronic technology led many young people into the wonderful digital world, radio technology showed a wonderful life, the prospects for science and technology. Electronics began to form a new discipline. Radio electronics, wireless communications began e-world journey.

The early radio technology promotes the development of electronic technology, foremost of which is from electronic vacuum tube technology to semiconductor electronic technology. Semiconductor electronics technology enables active devices to micro-miniaturization and low cost radio technology with greater popularity and innovation, and greatly broadened the field of non-radio control.

At the time of the invention of the transistor in 1947 by John Bardeen, Walter

Brattain, and William Shockley, the only way to assemble multiple transistors into a single circuit was to buy separate discrete transistors and wire them together. In 1959, Jack Kilby and Robert Noyce independently invented a means of fabricating multiple transistors on a single slab of semiconductor material. Their invention would come to be known as the integrated circuit, or IC, which is the foundation of our modern computerized world. An IC is so called because it integrates multiple transistors and diodes onto the same small semiconductor chip. Instead of having to solder individual wires between discrete components, an IC contains many small components that are already wired together in the desired topology to form a circuit. A large number of digital logic circuits, such as gates, counters, timers, shift registers, and analog switches, comparators, etc. provide excellent conditions for the electronic digital control, transforming the traditional mechanical control to electronic control.

70 years into the 20th century, large scale integrated circuit appeared to promote the conventional electronic circuit unit to specific electronic systems development. Many dedicated electronic system units into the integrated devices such as radios, electronic clocks, calculators. The work of electronic engineers in these areas is changed from the circuit, the system designed to debug into the device selection, peripheral device adapter. Electronic technology and electronic products enabled electronic engineers to reduce the difficulty.

1.1.2 Electronic Major

The training objective of electron techology major: the major trains the students who will adapt to a twenty-first century developing need, have improvement in terms of moral, intellectual and fitness level as well as appreciation of aesthetics. Get to know theoretical foundations of electron science and technology, signal analysis and processing and auto-control,etc. Based on circuit analysis and synthesis design capabilities and microprocessor (monolithic machine, programming controller PLC, embedded system, etc.), students will be more proficient in the use of EDA technology and modern computer electronics design and production technology, and can be engaged in a variety of practical electronic devices or products, development, and design. Cultivate the high-tech application professionals with strong innovative ability and practical ability.

Major courses: Engineering Drawing and CAD, Protel Technology, Computer System and Application, C Language Programming, Electrical and Electronic Technology, Circuit Synthesize Design, Radio Circuit, Microcontroller Theory and Applications, Embedded Systems, EDA Technology, Microprocessor Application Development and Production, Principles of Automatic Control, PLC Technology and Applications, Signal Analysis and Processing, Power Electronics, Household Electrical and Electronic Equipment and Maintenance, Modern Communications Technology, Professional English, etc.

Graduates of this major can gain the following knowledge and ability.

(1) Have theories, professional knowledge and basic skills of applying electron technology.

(2) Have the analysis ability, developing, keeping the electron product and the electronic equipment in repair, stronger computer application ability. Know how to monitor instrument performance in the commercial run, and develop, design and repair domestic appliances and master EDA technology.

(3) Master the document retrieval, inquiring method, have the certain English document reading ability, and have certain special field capability of sustainable development.

1.1.3 Introduction to Some Courses

As a student majoring in electronic technology, you will study many courses such as,

1. Direct Current (DC) Circuits & Alternating Current (AC) Circuits

This course covers the fundamental theory of passive devices (resistor, capacitor and inductor) and electrical networks supplied by a DC source, and then an introduction to the effects of alternating voltage and current in passive electrical circuits is given. This module also covers DC machines, three phase circuits and transformers.

2. Analog Electronics

This module introduces the characteristics of semiconductor devices in a range of linear applications and electronic circuits consisting of these devices (Fig 1.1). The following specific topics are covered.

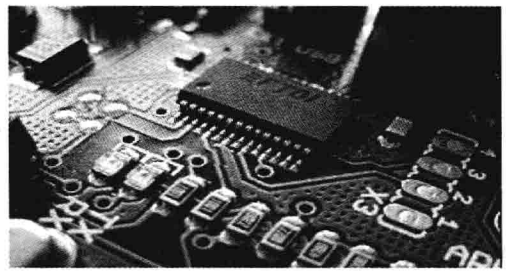

Fig 1.1 Electronic circuits

- Semiconductor diodes: PN junction diodes, special purpose diodes
- Transistors: field effect and bipolar transistors
- Signal amplifiers: practical amplifiers, biasing circuits, operational amplifiers circuit
- Other circuits: rectification, regulation and DC power supplies

3. Digital Electronics

In this unit, the following topics are covered.

- basic concepts about logic circuits
- number representations
- combinatorial logic circuits

- sequential logic circuits
- CMOS digital circuits
- logic operations theorems and Boolean algebra
- number operations (binary, hex and integers)
- combinatorial logic analysis and synthesis
- sequential logic analysis and synthesis
- registers
- counters
- bus systems
- CAD tools for logic design

4. Microcontroller Systems

The use of computers and microcontrollers is now found in every field of the electronic industry. This use will continue to grow at a rapid pace as computers become more complex and powerful. The ability to program these devices will make a student an invaluable talent to the growing electronic industry. This module enables the students to program a simple microcontroller to perform typical industrial tasks. Assembler and C are used to program the MPU (Microprocessor Unit). The students will set up the internal devices such as RS232 port, timer, interrupts, counters, I/O ports, ADC etc. The program will then use these devices for control operations.

5. Computer Programming for Engineering Applications

It is a continuation of more advanced programming techniques. The language of C will be used for teaching purposes. Emphasis is towards the use of programming for engineering applications and problem solving. The electronic technology will provide a sound educational foundation to enable graduates to follow a career in electrical engineering, power and control engineering, electronic technology computer engineering, telecommunications engineering etc.

Technical Words and Phrases

electronics	[ilek'trɔniks]	*n.*	电子学
representative	[repri'zentətiv]	*adj.*	代表性的，典型的
telegraph	['teligrɑf]	*n.*	电报，电信
telemetry	[ti'lemitri]	*n.*	遥测技术，测距术
digital	['didʒitəl]	*adj.*	数字的
vacuum	['vækjuəm]	*n.*	真空
tube	[tju:b]	*n.*	管
semiconductor	[semikən'dʌktə]	*n.*	半导体
miniaturization	[ˌminiətʃərai'zeiʃən]	*n.*	小型化；微型化
innovation	[inəu'veiʃən]	*n.*	革新，改革，创新

assemble	[ə'sembl]	*vt.*	集合，召集，聚集；配装，装
circuit	['sə:kit]	*n.*	电路；回路；线路图
slab	[slæb]	*n.*	厚板，平板；厚片
solder	['səldə]	*vt.*	焊接
topology	[təu'pɔlədʒi]	*n.*	拓扑数学
analog	['ænəlɔ:g]	*n.*	模拟
sensor	['sensə]	*n.*	传感器
servo	['sə:vəu]	*n.*	伺服电动机
scale	[skeil]	*n.*	比率；缩尺
adapter	[ə'dæptə]	*n.*	接合器；转接器
communication	[kəˌmju:ni'keiʃən]	*n.*	讯息；通信
promote	[prə'məut]	*vt.*	促进；发扬；引起
major	['meidʒə]	*adj.*	主要的
		n.	主修科目，专业
microprocessor	[maikrəu'prəusesə]	*n.*	微处理机
dyadic	[dai'ædik]	*adj.*	二价的；双值的；双积的；二数的
pragmatism	['prægmətizəm]	*n.*	实用主义；实际观察
innovative	['inəuveitiv]	*adj.*	创新的
comparatively	[kəm'pærətivli]	*adv.*	对比地；比较地
synthesize	['sinθisaiz]	*vt.*	综合；合成；(使)合成
monolithic	[mɔnə'liθik]	*adj.*	整体的；庞大的
instrument	['instrumənt]	*n.*	仪器；器具
commercial	[kə'mə:ʃəl]	*adj.*	商业的，商务的
retrieval	[ri'tri:vəl]	*n.*	纠正；补偿

1.2 Reading Materials

Do You Know These Electronic Systems

Some electronic systems are familiar from everyday life. For example, we encounter radios, televisions, telephones, and computers on a daily basis. Other electronic systems are present in daily life, but are less obvious. Electronic systems are used in automobiles to control fuel mixture and ignition timing to maximize performance and minimize undesirable emissions from automobile engines. Electronics in weather satellites (Fig 1.2) provide us with a continuous detailed picture of our planet.

Other systems are even less familiar. For example, a system of satellites known as the Global Positioning System (GPS) has been developed to provide three-dimensional information for ships, aircrafts and cars anywhere on the earth. This is possible because signals emitted by several satellites can be received by the vehicle, by comparing the time of

arrival of the signals and by using certain information contained in the received signals concerning the orbits of the satellites, the position of the vehicle can be determined.

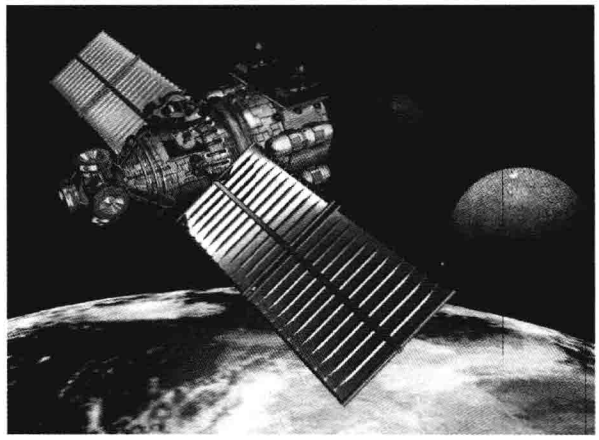

Fig 1.2 Weather satellites

Other electronic systems include the air-traffic control system, various radars, compact-disc (CD) recording equipment and players, manufacturing control systems, and navigation systems.

1.3 Knowledge(专业英语特点)

一、专业英语与基础英语不同

专业英语专业性极强,这种专业性是一种综合能力的体现,绝非"普通英语知识加专业词汇"那么简单。翻译专业英语时只有把英语知识、专业知识、汉语运用能力及英汉两种语言的异同结合起来统筹考虑才能得到较为准确的翻译结果。

Eg:The thermistor is a ceramic semiconductor bead, rod or disk.

普通英语翻译:热敏电阻是一种陶瓷半导体圆珠、圆棒或圆片。

专业英语翻译:热敏电子是一种陶瓷半导体器件,它(一般)被做成圆珠形、圆棒形或圆片形。

按普通英语翻译时这句话把热敏电阻翻译成了圆珠、圆棒或圆片,而不是半导体器件。显然从专业角度来讲,其逻辑上是错误的。

专业英语至少应包括以下四个方面的能力要求。

1. 懂英语

即要求具备相当的英语知识与能力,包括词法、语法、文法等以及基本的英语背景知识。

2. 具备必要的、准确的、较全面的专业知识

既要求在汉语环境下具备正确、丰富的专业知识及一定的专业技能,同时又具有相关的专业英语词汇、句型、方法等。

3. 娴熟的汉语表达能力

即要求运用汉语的能力要熟练、流畅、准确。

4. 英语、汉语两种语言间的融通能力

即要求对两种语言间的差异与共性有必备的了解，进而能够自如、准确、流畅地进行语言转换。

“专业英语”就是这四项能力的综合运用。

二、专业英语特点

1. 语言表达的规范性和逻辑性

在专业英语的运用中，尽量保持书面专业英语中的完整、严谨等特点，采用近似于书面表述的口语表达方式，很少采用日常口语中的非正式用语。

2. 专业英语所使用的词汇具有统一性与稳定性

(1) 纯专业性词汇都是随科技发展而新创建出来的，多见于新的学科中，词义单一。如diode(二极管)，radar(雷达)，laser(激光)，ohm(欧姆)等。

(2) 纯科技性符号、公式等，一般只用在专业文章中。

(3) 专业上专用的一些缩略语，如 PC(个人计算机)，IC(集成电路)，AC(交流电路)，AM(调幅)，CAD(计算机辅助设计)，EDA(电子设计自动化)，PCB(印制电路板)等。

3. 专业英语表达上的客观性

专业英语中论述者在意思表达上努力避免出现基于主观性或个人行为的表述形式，尽量采用一种非个人化的表述方式，目的是力求体现出科技知识的客观性与科学性。实现这一表述方式的具体方法除了尽量采用仪器仪表读数、有依据的数字等来表述外，语言结构上还经常采用“被动语态”、“祈使句”等句子结构。

4. 专业英语论述的严谨性与逻辑性

严谨性与逻辑性是专业英语的核心。

1.4 Exercises

Ⅰ. Translate the following phrases and expressions

1. 电子技术
2. 无线通信
3. 计算机工程
4. 组合逻辑电路
5. DC source
6. signal amplifier
7. integrated circuit
8. sequential logic circuits
9. radio technology computer engineering
10. alternating current circuits

Ⅱ. Translate the following sentences into Chinese

1. Would you go to a pop concert that had no amplifiers, large screens or lighting effects?