



高等职业教育“十一五”规划教材

高职高专电子信息类系列教材

# 电子信息专业英语

English for Electronics & Information

周柏清 主 编



提供电子课件



科学出版社

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周柏清 主编

徐文琴 主审

科学出版社

北京

## 内 容 简 介

我们在调研了电子信息行业部分工程人员的工作经验的基础上,结合自身多年从事电子信息专业英语的教学实际编写了本书。全书以电子技术的发展为主线,涵盖了电力电子、自动控制、计算机、通信等知识,基本覆盖了当代电子信息技术的各个领域。

本书选材新颖、风格多样,从实时、实用、实效出发,旨在逐步提高学生的阅读、理解和翻译电子信息技术专业书刊资料的能力,为学生今后能够以英语为工具,获取和交流专业技术信息打下良好的基础。

本书可作为高职高专院校电子信息类相关专业的专业英语教材,也可作为广大科技人员学习电子信息专业英语的参考用书。

本书配有电子课件等教学资源,下载网址为: [www.abook.cn](http://www.abook.cn)。

### 图书在版编目(CIP)数据

电子信息专业英语/周柏清主编. —北京:科学出版社,2009

(高等职业教育“十一五”规划教材·高职高专电子信息类系列教材)

ISBN 978-7-03-023664-7

I. 电… II. 周… III. ①电子技术-英语-高等学校:技术学校-教材②信息技术-英语-高等学校:技术学校-教材 IV. H31

中国版本图书馆CIP数据核字(2008)第196404号

责任编辑:孙露露/责任校对:刘彦妮

责任印制:吕春珉/封面设计:东方人华平面设计部

科学出版社出版

北京东黄城根北街16号  
邮政编码:100717

<http://www.sciencep.com>

新蕾印刷厂印刷

科学出版社发行 各地新华书店经销

\*

2009年2月第一版 开本:787×1092 1/16  
2009年2月第一次印刷 印张:9 1/2  
印数:1—3 000 字数:208 000

定价:19.00元

(如有印装质量问题,我社负责调换<新蕾>)

销售部电话 010-62134988 编辑部电话 010-62138978-8212

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举报电话:010-64030229; 010-64034315; 13501151303

## 本书编写人员

主编 周柏清

主审 徐文琴

参编 (按姓氏笔画排序)

朱学亮 朱建伟 刘恒娟 许勇刚 储海燕



# 前言

## Preface

专业英语的教学目的是指导学生阅读与自己专业相关的英语书刊和文选，使学生能以英语为工具，获取与专业相关的信息。

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。

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. 本书的取材多选自专业资料，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，有较强的可读性和易读性。
2. 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. 本书的内容编排以电子技术的发展为主线，涵盖了电子电力、自动控制、计算机、通信等知识，基本覆盖了当代电子信息技术的各个领域。
4. 本书教学重点不仅限于给出各种专业英语词汇，还注重讲解词汇在各种具体情况中的运用。
5. 本书内容共分17个单元，每个单元包括课文，课文重点、难点单词和短语，课文的参考译文，课后练习，以及翻译能力拓展练习，教师可根据具体情况进行选择。一般建议每2次课（2学时/次）讲授一个单元。本书在附录中给出了每个单元的课后练



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。

本书由周柏清任主编，统编全稿并编写了其中8个单元；许勇刚编写了1、6等两个单元；朱建伟编写了第2单元；刘恒娟编写了5、7、附录1和附录2等4个单元；储海燕编写了8、16、17等3个单元；朱学亮编写了第11单元。本书配有电子课件等教学资源，下载网址为：[www.abook.cn](http://www.abook.cn)。

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：[zhoubaiq@sina.com](mailto:zhoubaiq@sina.com)。

本书共分18个单元，每个单元包括：听力、词汇、语法、阅读、完形填空、翻译、写作、综合训练等。本书配有电子课件等教学资源，下载网址为：[www.abook.cn](http://www.abook.cn)。

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# Unit 1

## Descriptions of Electronics Technology Course

### 电子技术课程概述

#### Pre-reading

Read the following passage, pay attention to the questions.

- (1) What courses should a student majoring in the electronics study?
- (2) What is the main content of AC/DC Circuit Analysis?
- (3) What is the main content of Analog Electronics?
- (4) What career will a student majoring in the electronic technology follow?

#### 1.1 Text

*There can be no doubt that the 1900's is remembered as electronic century.*<sup>[1]</sup> Of course there have been other great advances in medicine, in transport, in science, in commerce and many other fields, but where would they have been without the instruments and devices that electronics has provided? How would you see a 3D virtual reality image of your beating heart without electronics? How would you get money out of the bank on a Sunday night without electronics? Would you go to a pop concert that had no amplifiers, large screens or lighting effects? Don't say you would rather watch TV—there would not be any.

毫无疑问二十世纪是电子的世纪。当然在医药、运输、科学、商业和其他领域也取得了很大的进步，但如果没有电子技术所提供的仪器和设备，这些行业能取得这么大的进步吗？没有电子技术，你无法看到自己跳动的心脏的3D虚拟逼真图像；没有电子技术，你无法在星期日的晚上从银行取钱。你愿意去一个没有音响放大器，没有大屏幕或灯光效果的流行音乐会吗？不要说你愿意在家看电视——没有电子技术也就没有电视。

#### 词汇加油站

[1]句中“*There can be no doubt that...*”译为“毫无疑问……”。

As a student majoring in<sup>1</sup> the electronic technology, you will study many courses such as:

### 1. AC<sup>2</sup>/DC<sup>3</sup> Circuit Analysis

This course studies the fundamental theory of passive<sup>4</sup> devices(resistance, capacitance and inductance), DC single and multi-source circuitry with the application of Loop<sup>5</sup>, Node<sup>6</sup> and Thevenin's theorems. Further topics include AC reactive circuits using both phasors<sup>7</sup> and complex numbers for determining reactance<sup>8</sup>, impedance<sup>9</sup> and power factor. Additional studies involve three-phase power using Delta and Wye configurations.

### 2. Basic Electricity

Topics include the electron theory, Ohm's Law, circuits, magnetism<sup>10</sup>, inductance<sup>11</sup>, capacitance<sup>12</sup>, and alternating current circuits. Students will construct circuits using voltmeters, ammeters, power supplies, signal generators, and oscilloscopes.

### 3. Basic Electronics

*It is a beginning course covering the fundamentals of solid-state components found in electronic circuits.* [2] Topics include the study of solid state diodes<sup>13</sup>, field effect transistors, and bipolar transistors. Students will learn their characteristics and some basic circuits in which these components are commonly used. Students will also use an electronic circuit software program to simulate various circuits.

### 4. Analog<sup>14</sup> Electronics

This module<sup>15</sup> introduces the characteristics of semiconductor devices in a range of linear applications. The topics covered are rectification<sup>16</sup>, regulation and DC power supplies, transistor<sup>17</sup>, differential amplifiers<sup>18</sup>, operational amplifiers, power amplifiers, oscillators<sup>19</sup>, RF and modulation circuits, voltage-controlled oscillators, phase-locked loops, linear and switching voltage regulators, triggered<sup>20</sup> semiconductor devices and optoelectronics<sup>21</sup>.

作为一个电子技术专业的学生, 你将要学习许多课程, 例如:

### 1. 直流电路与交流电路

这门课程学习无源器件(电阻、电容和电感)的基本理论, 直流单源和多源电路中的回路、结点以及戴维南定理。还包括用相量和复数确定交流反馈电路的电抗、阻抗以及功率因数。另外, 也包括三角接法和星形接法的三相电源。

### 2. 基础电学

主题包括电子理论、欧姆定律、电路、磁学、电感、电容和交流电路。学生将使用伏特计、电表、电源、信号发生器、示波器来构建电路。

### 3. 基础电子学

这门课程学习电子电路中的固体元件的基础知识。主要学习固态二极管、场效应管、双极晶体管。学生将学习它们的特性和使用这些常用元件的基本电路。学生还要用电子电路软件编程去仿真各种电路。

### 4. 模拟电子学

这个模块介绍了线性放大器中的半导体器件的特征。讨论的主题有整流, 稳压和直流电源, 晶体三极管, 差分放大器, 运算放大器, 功率放大器, 振荡器, 射频调制电路, 压控振荡器, 锁相环, 线性电压和开关电压调节器, 触发器等半导体设备以及光电子学。

## 5. Digital Electronics

Topics include: digital concepts; binary, hexadecimal, and BCD<sup>22</sup> number systems; TTL<sup>23</sup> and CMOS<sup>24</sup> integrated circuit logic gate technology; Boolean algebra; logic tables; combinational logic; monostable<sup>25</sup> and bistable<sup>26</sup> multivibrators<sup>27</sup>; synchronous<sup>28</sup> counters; decoders<sup>29</sup>; storage registers; shift registers; clock and timing circuits; serial and parallel adder circuits; liquid crystal displays and drivers; digital-to-analog and analog-to-digital converters; multiplexers<sup>30</sup> and demultiplexers; memory technology; and the use of digital electronic simulation software.

## 6. Microcontroller Systems

The use of computers and microcontrollers is now found in every field of the electronics industry.

## 5. 数字电子学

主题包括：数字概念；二进制、十六进制和二进制编码的十进制数制系统；TTL和CMOS集成电路逻辑门技术；布尔代数；逻辑表；组合逻辑；单稳态和双稳态多谐振荡器；异步计数器；解码器；存储寄存器；移位寄存器；时钟电路和计时电路；串并行加法器电路；液晶显示和驱动；数模转换器和模数转换器；多路（复用）器和（多路）信号分离器；存储技术；数字电子仿真软件的使用。

## 6. 微控制器系统

计算机及微控制器现在被广泛应用于电子工业的各个领域。随着

### 词汇加油站

[2]句中“covering the fundamentals of solid-state components found in electronic circuits”做“course”的后置定语，其中“found in electronic circuit”又做components的后置定语。

- |                                               |                                                              |
|-----------------------------------------------|--------------------------------------------------------------|
| 1. major ['meɪdʒə] in (在大学里)主修                | 18. amplifier [ˈæmplɪfaɪə] n. 放大器, 放大器                       |
| 2. AC(Alternating Current) 交流电                | 19. oscillator [ˈɒsɪleɪtə] n. 振荡器                            |
| 3. DC(Direct Current) 直流电                     | 20. trigger ['trɪɡə] vt. 引发, 触发器                             |
| 4. passive [ˈpæsiv] adj. 被动的(此处指无源的)          | 21. optoelectronics [ˈɒptəʊɪˌlekˈtrɒnɪks] n. 光电子学            |
| 5. loop [lu:p] n. 回路, 循环                      | 22. BCD(Binary-Coded Decimal) 二进制编码的十进制数                     |
| 6. node [nəʊd] n. 结点, 节点                      | 23. TTL(Transistor-Transistor Logic) 晶体管-晶体管逻辑(电路)           |
| 7. phasor [ˈfeɪzə] n. 相量                      | 24. CMOS(Complementary Metal Oxide Semiconductor) 互补金属氧化物半导体 |
| 8. reactance [riˈæktəns] n. 电抗                | 25. monostable [ˌmɒnəʊˈsteɪbl] adj. 单稳(态)的                   |
| 9. impedance [ɪmˈpiːdəns] n. 阻抗               | 26. bistable [baɪˈsteɪbl] adj. 双稳(态)的                        |
| 10. magnetism [ˈmæɡnɪtɪzəm] n. 磁性, 磁学         | 27. multivibrator [ˌmʌltɪvaɪˈbreɪtə] n. 多频振荡器                |
| 11. inductance [ɪnˈdʌktəns] n. 感应系数           | 28. synchronous [ˈsɪŋkrənəs] adj. 同步的, 同时发生的                 |
| 12. capacitance [kəˈpæsɪtəns] n. 电容           | 29. decoder [diˈkəʊdə] n. 解码器                                |
| 13. diode [ˈdaɪəʊd] n. 二极管                    | 30. multiplexer [ˌmʌltɪˈpleksə] n. 多路(复用)器                   |
| 14. analog [ˈænəlɒɡ] n. 类似物, 相似体, (计算机)模拟     |                                                              |
| 15. module [ˈmɒdju:l] n. 模数, 模块, 登月舱(此处指课程模块) |                                                              |
| 16. rectification [ˌrektɪfɪˈkeɪʃən] n. 整流     |                                                              |
| 17. transistor [trænˈzɪstə] n. 晶体管            |                                                              |

This use will continue to grow at a rapid pace as computers become more complex and powerful. This module will make a student to program a simple microcontroller to perform typical industrial tasks. Assembler<sup>31</sup> and C Language are used to write programs of the MPU (Microprocessor Unit). Students will set up the internal devices such as RS232 port, timer, interrupters, counters, I/O ports, ADC<sup>32</sup>, etc. The programs will then use these devices to control operations.

### 7. 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 solving problem.

### 8. Microprocessor Fundamentals

This course is a study of various digital subsystems, their use in digital computing and control systems, and the use of analytical tools necessary to perform analysis and problem diagnosis<sup>33</sup>. Topics include counter/shift register systems; digital subsystems using integrated circuit logic chips; encoding/decoding techniques; analog/digital conversion techniques; static<sup>34</sup>/dynamic<sup>35</sup> memory systems; and computer system organization.

*The Electronic technology will enable graduates to follow a career in electrical engineering, power and control engineering, electronics, computer engineering, telecommunications engineering, etc.* [3]

计算机变得更加复杂, 功能更加强大, 微控制器的应用范围将继续快速扩大。这个模块(教学)使学生能对一个简单的微控制器进行编程, 以便完成典型的工业上常用的控制任务。应用中常使用汇编语言和C语言对微处理器进行编程。学生将用到一些内部的器件如RS232接口、定时器、中断器、计数器、输入/输出口、模数转换器等, 利用这些器件通过编程可以控制操作。

### 7. 计算机编程及其在工程中的应用

该课程继续学习更高级的编程技术。C语言将被用作教学语言, 其重点是应用编程技术来解决工程应用问题。

### 8. 微机基础

这门课程学习各种数字子系统在数字计算、控制系统中的使用以及执行分析和问题诊断所必需的分析工具的使用。主要包括计数器/移位寄存器系统; 基于集成电路逻辑芯片的数字系统; 编码/解码技术; 模/数转换技术; 静态/动态存储系统和计算机系统的结构。

电子技术将使毕业生能从事以下的职业: 电子工程师、电力能源和控制工程师、电子设备技师、计算机工程师、电信工程师等。

## 词汇加油站

[3] “enable sb. to do ...”, 使人能(做)……

“follow a career in ...”, 从事……方面的职业。

31. assembler [ə'sembler] n. 汇编语言, 汇编程序

32. ADC (Analog Digital Converter) 模数转换器

33. diagnosis [ˌdaɪəg'nəʊsɪs] n. 诊断法, 诊断结论

34. static ['stætɪk] adj. 静态的

35. dynamic [daɪ'næmɪk] adj. 动态的



## 1.2 Exercises

1. Translate the following phrases into English.

- |           |            |
|-----------|------------|
| (1) 反馈电路  | (2) 三相电源   |
| (3) 整流电路  | (4) 差分放大电路 |
| (5) 锁相环   | (6) 布尔代数   |
| (7) 组合逻辑  | (8) 液晶显示   |
| (9) 同步计数器 | (10) 移位寄存器 |

2. Identify the following to be True or False according to the text.

- (1) Modern advances in the fields of computer, control system, communication have a close relationship with electronics.
- (2) AC/DC Circuit Analysis include differential amplifiers.
- (3) TTL and CMOS integrated circuit logic gate technology belong to Analog Electronics.
- (4) Assembler is one and only language used to write programs of the MPU (Microprocessor Unit).
- (5) The student majoring in electronics technology doesn't need to study computer programming.

3. Reading Comprehension.

- (1) Three-phase power have \_\_\_\_\_ means of connection.
- A. one  
B. two  
C. three  
D. four
- (2) Analog electronics introduces the characteristics of semiconductor devices in a range of \_\_\_\_\_ applications.
- A. engineering  
B. communication  
C. complex  
D. linear
- (3) Which is the topic of analog electronics? \_\_\_\_\_
- A. Magnetism  
B. Combinational logic  
C. Shift registers  
D. Phase-locked loop
- (4) Solid-state components found in electronic circuits include \_\_\_\_\_.
- A. solid state diodes  
B. field effect transistors  
C. bipolar transistors  
D. all above
- (5) \_\_\_\_\_ and C Language are used to write programs of the MPU (Microprocessor Unit).
- A. Visual Basic  
B. Java  
C. Assembler  
D. Pascal

## 1.3 Developing Your Translating Skill

In general, an electronic measuring instrument<sup>1</sup> is made up of the three elements: transducer<sup>2</sup>, signal modifier<sup>3</sup> and indicating device.

The transducer converts a nonelectrical<sup>4</sup> signal into an electrical signal; therefore, a transducer is required only if the quantity to be measured is non-electrical.

The signal modifier is required to process the incoming electrical signal to make it suitable for application to the indicating device. The signal may need to be amplified until it is of sufficient amplitude to cause any appreciable<sup>5</sup> change at the indicating device. Other types of signal modifiers might be voltage dividers<sup>6</sup>, to reduce the amount of signal applied to the indicating device, or waveshaping<sup>7</sup> circuits such as rectifiers<sup>8</sup>, filters<sup>9</sup>, or choppers<sup>10</sup>.

The indicating device is generally a deflection-type<sup>11</sup> meter for such general-purpose instruments as voltmeters<sup>12</sup>, current meters or ohmmeters.

Electronic measuring instruments may be used to measure current, voltage, resistance, temperature, sound level, pressure, or many other physical quantities; however, regardless of the units on the calibrated<sup>13</sup> scale of the indicating meter, the pointer deflects up scale because of the flow of electrical current.

The finest instruments available may provide inaccurate results when mistreated or improperly used. There are several basic rules that, if observed, generally ensure that instruments provide acceptable measurement results.

Most instruments are delicate<sup>14</sup>, sensitive devices and should be treated with care. Before using an instrument one should be thoroughly familiar with its operation. The best source of information about an instrument is the operating and instructions manual, which is provided with any new instrument purchased.



Electronics laboratories should have these manuals on file for easy access. If you are not thoroughly familiar with an instrument's operation, specifications, functions, and limitations, read the manual before using the instrument.

You should select an instrument to provide the degree of accuracy required. Although a high degree of accuracy and good resolution are desirable, in general, the cost of the instrument is directly related to these properties<sup>15</sup>.

Once an instrument has been selected for use, it should be visually inspected for any obvious physical problems such as loose knobs, damaged case, bent pointer, loose handle, damaged test leads, and so on. If the instrument is powered by an internal battery, the condition of the battery should be checked prior to use. Many instruments have a "battery check" position for this purpose. When a battery must be replaced, make sure the proper replacement is used and that it is properly.

Before connecting the instrument into the circuit, make certain the function switch is set to the proper function and the range-selector switch to the proper range. If there is any question at all to the proper range, the instrument should be set to its highest range before connecting it into the circuit; then it should be switched to lower ranges until an approximate midscale<sup>16</sup> reading is obtained. There are many other considerations<sup>17</sup> such as circuit loading, impedance matching, and frequency response that must be dealt with in order to obtain the most accurate results possible using test equipment.



1. instrument ['ɪnstrəmənt] *n.* 工具, 手段, 器械, 器具, 手段
2. transducer [trænʒ'dju:sə] *n.* 传感器, 变频器, 变换器
3. modifier ['mɒdɪfaɪə] *n.* 修正的人, 改造者, [语]修饰语, 修饰成分
4. nonelectrical ['nɒni'lektɪkəl] *adj.* 非电的
5. appreciable [ə'pri:ʃiəbl] *adj.* 可感知的, 可评估的
6. divider [di'vaɪdə] *n.* 分割者, 间隔物, 分配器, 圆规
7. waveshaping ['weɪvʃeɪpɪŋ] *adj.* 整形的
8. rectifier ['rektɪfaɪə] *n.* 纠正者, 整顿者, 校正者, 整流器
9. filter ['fɪltə] *n.* 滤波器, 过滤器, 滤光器, 筛选
10. chopper ['tʃɒpə] *n.* 斩波器
11. deflection [di'flekʃən] *n.* 偏斜, 偏转, 偏差
12. voltmeter ['vɒlɪt.mi:tə(r)] *n.* 伏特计
13. calibrate ['kælibreɪt] *v.* 校准
14. delicate ['delɪkət] *adj.* 精巧的, 精致的, 脆弱的, 灵敏的, 精密的
15. properties ['prɒpətɪs] *n.* 道具
16. midscale [mɪdskel] *n.* 中间刻度
17. consideration [kənsɪdə'reɪʃən] *n.* 体谅, 考虑, 需要考虑的事项, 报酬

# Unit 2

## Electrical Components

### 电子器件

#### Pre-reading

Read the following passage, pay attention to the questions.

- (1) What is Ohm law?
- (2) What makes up a capacitor?
- (3) What is the characteristic of a diode?

#### 2.1 Text

There are several important basic electrical components that are commonly found in the circuits of virtually all PC parts and peripherals. These devices are the fundamental building blocks of electrical and electronic circuits, and can be found in great numbers on motherboards, hard disk logic boards, video cards and just about everywhere else in the PC, including places that might surprise you. They can be used and combined with each other and dozens of other devices, in so many different ways that I could not even begin to describe them all.

##### 1. Battery<sup>1</sup>

A direct current<sup>2</sup> electricity source of a specific voltage<sup>3</sup>, used primarily in small circuits.

##### 2. Resistor<sup>4</sup>

As you could probably guess from the name,

在所有的PC部件和外设电路中几乎都可以找到一些重要的基本电子器件。这些器件是电子电路的基本构件，在PC的主板、硬盘逻辑电路、视频卡，甚至是任何让你惊奇的地方都可大量发现。它们可以和别的器件以很多的难以言尽的方式组合在一起使用。

##### 1. 电池

指定电压的直流电源，主要用在小电路中。

##### 2. 电阻器

正如名字所示，电阻器增加