

机电英语

高等教育应用型本科重点专业精品规划教材（外语类）

English for
Electromechanical Engineering

丛书总主编 冯光华

严红烨 蔡丽慧 王电兴 主编



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语言学教程

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高等教育应用型本科重点

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前言

《机电英语》于2016年修订出版。该书先作为校内教材使用的时候,得到了广大读者的肯定,并受到了广大学生的好评。与此同时,我们也收到了武汉工程科技学院机电学院相关专业师生提出的不少宝贵意见。因此,根据编著者的教学实践和与机电行业相关专家合作积累的经验,正式修订并出版。

本书主要根据武汉工程科技学院机电学院各专业的英语口语教材和机电英语选修课教材编写而成。在武汉工程科技学院多年教学实践的基础上,编著者对上述内容做了进一步的修改、充实、提高,改编成本书。《机电英语》教材遵循“工学结合,能力为本”的教学理念和“实用为主,够用为度”的教学原则编写,以期培养和提高学生实际运用英语语言的能力。全书共八个单元,每个单元分为专业词汇、实用对话、阅读、知识拓展、综合练习等五个部分。其中实用对话部分选择的是职场中的涉外英语内容,设置真实的语境,培养学生的英语交流能力;阅读部分选用与电机机械、机电建模、机电一体化、电子通信、信息技术、云计算、系统工程专业相关的文章。《机电英语》内容新颖、通俗、实用,既适用于提高学生的语言技能,又有利于培养学生的职业素质与技能。全书图文并茂,集职业性、实用性、适时性和趣味性于一体。这八个单元的内容既自成体系,又互相关联,难度适中,为配合教学,还编有一定量的练习,供学生在课堂内外使用。建议学生在使用时多精读课本,以提高学习效果。

本教材注重英语听说口语练习和专业英语阅读练习,形式主要包含:

1. 口语练习,训练形式多样,既有对每章主题的相关内容进行交流或进行拓展性小组讨论,也有就图表信息或提示信息进行个人陈述等。口语练习的设计旨在培养学生运用英语表达相关专业知识的能力,做到信息输入和信息输出同步进行。

2. 专业英语阅读练习,阅读部分选用与电机机械、机电建模、机电一体化、电子通信、信息技术、云计算、系统工程专业相关的文章,每个单元从课文到练习上的设计上由浅入深,既突出了基础知识也强调实际应用,既突出专业特色又能充分体现英语教学的规律,达到语言技能与职业知识技能的整合。

《机电英语》适合作为应用技术型高校机电专业的专业英语教材,供应用技术型高校师生使用。

编著者

2016年9月16日

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Unit 1 Electromechanics

Learning Objectives

After completing this unit, you will be able to do the following:

1. Grasp the main idea and the structure of the text;
2. Master the key language points and grammatical structure in the text;
3. Understand the basic concepts in electromechanics;
4. Conduct a series of reading, listening, speaking and writing activities related to the theme of the unit.

Technical Terms

In this unit, you will learn some technical terms in electromechanics listed below:

- electrical engineering;
- mechanical engineering;
- electric typewriters;
- digital computers;
- relays.

Outline

The following are the main sections of this unit:

1. Warm-up Activity;
2. Text A;
3. Situational Conversation;
4. Reading Comprehension;
5. Translation Skills;
6. Exercises.

Vocabulary

The listed below are some words appearing in this unit that you should make part of your vocabulary:

- microcontroller;
- traffic lights;
- washing machines;
- telegraphy;
- voltage.



Looking Ahead

The purpose of Electro-mechanical Modelling is to model and simulate an electro-mechanical system, so that its physical parameters can be examined before the actual system is built. Parameter estimation and physical realization of the overall system are the major design objectives of electro-mechanical modelling. Theory driven mathematical models can be used for or applied to other systems to judge the performance of the joint system as a whole.

The modelling of pure mechanical systems is mainly based on the Lagrangian which is a function of the generalized coordinates and the associated velocities. If all forces are derivable from a potential, then the time behavior of the dynamic systems is completely determined. For simple mechanical systems, the Lagrangian is defined as the difference of the kinetic energy and the potential energy.

In consequence, we have quantities (kinetic and potential energy, generalized forces) which determine the mechanical part and quantities (co-energy, powers) for the description of the electrical part. This offers a combination of the mechanical and electrical parts by means of an energy approach. As a result, an extended Lagrangian format is produced.

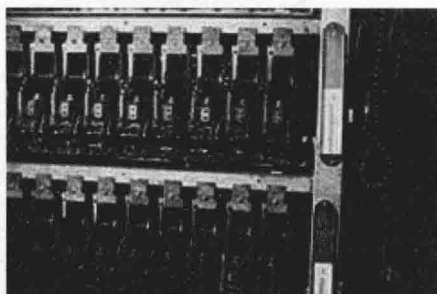


Introduction

In the interest of public safety and a worry-free experience every time you fly, airlines would encourage you to familiarize yourself with this information.

Core Contents

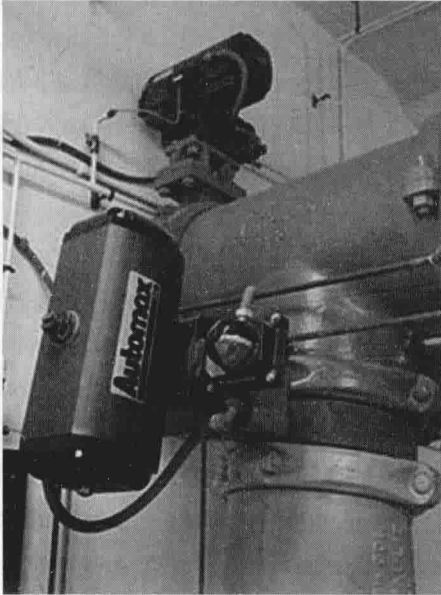
1. The continuing discussion of the definition of Electromechanics.
2. Discussion of the automated telephone exchanges that were widely used in the early days.



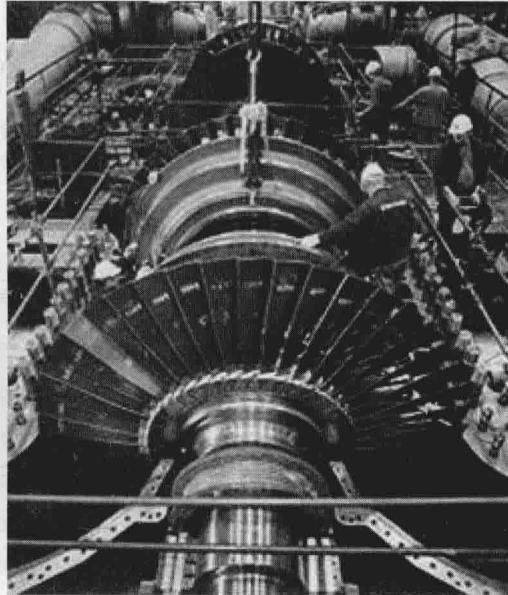


Warm-up Activity

What were widely used in early automated telephone exchanges?



The solenoid valve



A steam turbine used to provide electric power



Part One : Text A History of Electromechanics

In engineering, Electromechanics combines electrical and mechanical processes and procedures drawn from electrical engineering and mechanical engineering. Electrical engineering in this context also encompasses electronics engineering.

Devices which carry out electrical operations by using moving parts are known as electromechanical. Strictly speaking, a manually operated switch is an electromechanical component, but the term is usually understood to refer to devices which involve an electrical signal to create mechanical movement, or mechanical movement to create an electric signal, often involving electromagnetic principles such as in relays, which allow a voltage or current to control other, oftentimes isolated circuit voltage or current by mechanically switching sets of contacts, and solenoids, by which the voltage can actuate a moving linkage as in solenoid valves. Piezoelectric devices are electromechanical, but do not use electromagnetic principles. Piezoelectric devices can create sound or vibration from an electrical signal or create an electrical signal from sound or mechanical vibration.

Before the development of modern electronics, electromechanical devices were widely used in complicated systems and subsystems, including electric typewriters,

teleprinters, very early television systems, and the very early electromechanical digital computers.

Relays originated with telegraphy as electromechanical devices used to regenerate telegraph signals. In 1885, Michael Pupin at Columbia University taught mathematical physics and electromechanics until 1931.

The Strowger switch, the Panel switch, and similar ones were widely used in early automated telephone exchanges. Crossbar switches were first widely installed in the middle 20th century in Sweden, the United States, Canada, and the Great Britain, and these quickly spread to the rest of the world—especially the Japan. The electromechanical television systems of the late 19th century were less successful.

Electric typewriters developed, up to the 1980s, as “power-assisted typewriters”. They contained a single electrical component, the motor. The keystroke used to move a typebar directly, but now it engaged mechanical linkages that directed mechanical power from the motor into the type bar. This was also true of the later IBM Selectric. At Bell Labs, in the 1940s, the Bell Model V computer was developed. It was an electromechanical relay-based device; cycles took seconds. In 1968 electromechanical systems were still under serious consideration for an aircraft flight control computer, until a device based on large scale integration electronics was adopted in the Central Air Data Computer.

At the beginning of the last third of the century, much equipment which for most of the 20th century would have used electromechanical devices for control, has come to use less expensive and more reliable integrated microcontroller circuits containing millions of transistors, and a program to carry out the same task through logic, with electromechanical components only where moving parts, such as mechanical electric actuators, are a requirement. Such chips have replaced most electromechanical devices, because any point in a system which must rely on mechanical movement for proper operation would have mechanical wear and eventually fail. Properly designed electronic circuits without moving parts will continue to operate properly almost indefinitely and are used in most simple feedback control systems, and would appear in huge numbers in everything from traffic lights to washing machines.

As in 2010, approximately 16,400 people work as electro-mechanical technicians in the US, about 1 out of every 9,000 workers. Their median annual wage is about 50% more than the median annual wage over all occupations.

Words and Expressions

electromechanics [ɪˌlektərəʊmɪˈkæniks] *n.* 电机机械

procedure [prə'si:dʒə] *n.* 程序, 手续; 步骤
 drawn from 从……中得到; 从……提取
 encompass [ɪn'kʌmpəs; en-] *vt.* 包含; 包围, 环绕; 完成
 strictly speaking 严格地说; 严格来说
 voltage ['vɒltɪdʒ] *n.* [电] 电压
 current ['kʌr(ə)nt] *n.* (水、气、电) 流; 趋势; 涌流
 solenoid ['səʊlənɔɪd] *n.* [电] 螺线管; 螺线形电导管
 valve [vælv] *n.* 阀; [解剖] 瓣膜; 真空管; 活门
 relay ['ri:leɪ] *n.* [电] 继电器
 originated with 源于
 switch [swɪtʃ] *n.* 开关; 转换; 鞭子 *vi.* 转换; 抽打; 换防
 keystroke ['ki:stɹəʊk] *n.* 击键; 按键
 typebar ['taɪpbɑ:] *n.* 铅字连动杆
 selectric [si'lektrɪk] *n.* 电动打字机
 under serious consideration 在认真考虑之下
 integration [ɪntrɪ'greɪʃ(ə)n] *n.* 集成; 综合
 microcontroller [ˌmaɪkrəʊkən'trəʊlə] *n.* [自] 微控制器
 indefinitely [ɪn'defɪnɪtli] *adv.* 不确定地, 无限期地; 模糊地, 不明确地
 feedback ['fi:dbæk] *n.* 反馈; 成果, 资料; 回复
 in huge numbers 大量的

Exercise 1: Special terms.

- | | |
|------------------------------|-------|
| 1. electrical and mechanical | _____ |
| 2. electrical engineering | _____ |
| 3. mechanical engineering | _____ |
| 4. 电信号 | _____ |
| 5. 机械联动装置 | _____ |
| 6. 一个电子元件 | _____ |

Exercise 2: Answer the following questions.

1. What is electromechanics?
2. What is a manually operated switch?
3. What were widely used in early automated telephone exchanges?
4. As in 2010, how many people work as electro-mechanical technicians in the US?

Exercise 3: Define the following terms with information from Text A.

- 1.electromechanics
- 2.relay
- 3.microcontroller



Part Two : Situational Conversation

At a Chinese Restaurant

A: It's very nice of you to invite me.

B: I'm very glad you could come, Mr. Liu. Would you like to take a seat at the head of the table? It's an informal dinner, please don't stand on ceremony... Mr. Liu, would you like to have some chicken?

A: Thank you. This is my first time to come to a Chinese restaurant. Could you tell me the different features of Chinese food?

B: Generally speaking, Cantonese food is a bit light; Shanghai food is rather oily; and Hunan dishes are very spicy, with a strong and hot taste.

A: Chinese dishes are exquisitely prepared, delicious, and very palatable. They are very good in colour, flavor and taste.

B: Mr. Liu, would you care for another helping?

A: No more, thank you. I'm quite full.

B: Did you enjoy the meal?

A: It was the most delicious dinner I've had for a long time. It was such a rich dinner.

B: I'm so glad you like it.

A: Thank you very much for your hospitality.

Notes:

At a Chinese Restaurant

在中餐馆

A: It's very nice of you to invite me.

你真是太好了，请我来做客。

B: I'm very glad you could come, Mr. Liu. Would you like to take a seat at the head of the table? It's an informal dinner, please don't stand on ceremony... Mr. Liu, would you like to have some chicken?

刘先生，您能来我很高兴，请上坐。这是一次家常便饭，请大家别客气。刘先生，

要吃点儿鸡肉吗?

A: Thank you. This is my first time to come to a Chinese restaurant. Could you tell me the different features of Chinese food?

谢谢, 这是我第一次来中餐馆, 请给我讲讲中国菜的不同特色好吗?

B: Generally speaking, Cantonese food is a bit light; Shanghai food is rather oily; and Hunan dishes are very spicy, having a strong and hot taste.

一般来讲, 广东菜清淡一些; 上海菜比较油腻; 湖南菜香味儿浓, 辣味儿很重。

A: They are very good in colour, flavor and taste.

中国菜做得很精细, 色、香、味俱全。

B: Mr. Liu, would you care for another helping?

刘先生, 再来一点儿吧?

A: No more, thank you. I'm quite full.

不啦, 谢谢。我已经够饱了。

B: Did you enjoy the meal?

您吃得怎么样?

A: It was the most delicious dinner I've had for a long time. It's such a rich dinner.

好久没有吃过这样美味的饭菜了。这顿饭菜太丰盛了。

B: I'm so glad you like it.

你能喜欢, 我不胜荣幸。

A: Thank you very much for your hospitality.

谢谢你的盛情款待。

Exercise 1: Sentence patterns.

1. It's very nice of you to invite me.
2. Chinese dishes are exquisitely prepared, delicious, and very palatable. They are very good in colour flavor and taste.
3. Could you tell me the different features of Chinese food?
4. It's an informal dinner.
- 5 I'm quite full.

Exercise 2: Complete the following dialogue in English.

A: Now, you are boarding the plane. We're sorry that we haven't done much to help you when you are in China.

B: I appreciate what you have done for me. Everything I have seen here has left a deep impression on me. I really don't know how to express my thanks to you.

A: 1 _____

我们很乐意给你提供帮助。

B: 2 _____

请代我向张先生和其他的朋友们转达我的谢意好吗？

A: I'd like to. I'm sure your visit will help to promote the friendship and understanding between us. Welcome to China again.

我一定转达。我坚信你的来访将促进我们双方的友谊和了解，欢迎你再访中国。

B: 3 _____

当然，我会的。好吧，是告别的时候了，飞机就要起飞了，希望你将来有机会来美国。

A: 4 _____

谢谢。如果有机会，我会去的。再见，一路平安！

B: Goodbye!

Part Three: Reading Comprehension

Questions 1 to 5 are based on the following passage .

For years, high school students have received identical textbooks as their classmates. Even as students have different learning styles and abilities , they are force-fed the same materials , “Imagine a digital textbook my book because I’m a different person and learn differently, which is different from yours,” said Richard Baraniuk , founder of OpenStax .

OpenStax will spend two years developing the personalized books and then test them on Houston-area students . The books will also go through a review and evaluation process similar to traditional textbooks . Baraniuk expects 60 people to review each book before the publication to ensure its quality.

The idea is to make learning easier , so students can go on to more successful careers and lives . Baraniuk isn’t just reproducing physical textbooks on digital devices , a mistake e-book publishers have made . He’s seriously rethinking that the educational experience should be in a world of digital tools . To do this means involving individuals with skills traditionally left out of the textbook business . Baraniuk is currently hiring cognitive scientists and machinelearning experts .Baraniuk wants to use the tactics (策略) of Google , Netflix and Amazon to deliver a personalized experience .These web services all rely on complex algorithms (算法) to automatically adjust their offerings for customers.

Just as Netflix recommends different movies based on your preference and viewing history , a textbook might present materials at different pace. Thanks to machine learning the textbook—which will be stored on a range of digital devices—will automatically adjust itself. As a student learns about a topic, he or she could be interrupted by brief quizzes

that evaluate whether he or she masters the area. Depending on how the student does, the subject could be reinforced with more materials. Or a teacher could be automatically emailed that the student is struggling with a certain concept and could use some one-to-one attention.

This personalized learning experience is possible thanks to the wealth of data that a digital textbook can track. The data can be used to better track students' progress during a course. Parents and teachers can monitor students' development and provide more proper assistance in time. With personalized learning methods, our students' talents will be better developed.

1. What do we learn about personalized books?
 - A) Their quality will be ensured since they are developed by OpenStax.
 - B) They will be examined and judged before being published.
 - C) They will overlook different learning styles and abilities.
 - D) They will be much similar to traditional textbooks.
2. In which aspect have e-book publishers done incorrectly?
 - A) They have only put emphasis on learning experience.
 - B) They have made it difficult to access to e-books.
 - C) They have made it rather boring and inconvenient to learn.
 - D) They have just produced an electronic copy of print textbooks.
3. What does Richard Baraniuk mean by "the educational experience should be in a world of digital tools" (Line 3-4, Para.3) ?
 - A) Education should employ the machine to improve learning.
 - B) Education should involve traditional textbooks in the digital world.
 - C) Education should include obtaining skills by adapting machine learning.
 - D) Education should reproduce traditional textbooks on the Web services.
4. Personalized textbooks are beneficial to students because _____.
 - A) they store the fixed material on different digital machines.
 - B) they quiz the students to make them more confident.
 - C) they automatically present movies based on students' preference.
 - D) they automatically matche learning material to students' needs.
5. Personalized learning experience may become possible owing to _____.
 - A) a great amount of digital equipment
 - B) the students' continuous progress
 - C) a great amount of digital information
 - D) parents' and teachers' constant attention



Part Four: Translation Skills

常用的翻译技巧有增译法、省译法、转换法、拆句法、合并法、正译法、反译法、倒置法、包孕法、插入法、重组法和综合法等。

增译法

增译法指根据英汉两种语言不同的思维方式、语言习惯和表达方式，在翻译时增添一些词、短句或句子，以便更准确地表达出原文所包含的意义。这种方式多半用在汉译英里。汉语无主句较多，而英语句子一般都要有主语，所以在翻译汉语无主句的时候，除了少数可用英语无主句、被动语态或“there be”结构来翻译以外，一般都要根据语境补出主语，使句子完整。

英汉两种语言在名词、代词、连词、介词和冠词的使用方法上也存在很大差别。英语中代词使用频率较高，凡说到人的器官和归某人所有或与某人有关的事物时，必须在前面加上物主代词。因此，在汉译英时需要增补物主代词，而在英译汉时又需要根据情况适当地删减。英语词与词、词组与词组以及句子与句子的逻辑关系一般用连词来表示，而汉语则往往通过上下文和语序来表示这种关系。因此，在汉译英时常常需要增补连词。英语句子也离不开介词和冠词。另外，在汉译英时还要注意增补一些原文中暗含而没有明言的词语和一些概括性、注释性的词语，以确保译文意思的完整。总之，通过增译，一是保证译文语法结构的完整，二是保证译文意思的明确。如：

① What about calling him right away? 马上给他打个电话，你觉得如何？（增译主语和谓语）

② If only I could see the realization of the four modernizations. 要是我能看到四个现代化实现该有多好啊！（增译主句）

③ Indeed, the reverse is true. 实际情况恰好相反。（增译名词）

④ 就是法西斯国家本国的人民也被剥夺了人权。

Even the people in the fascist countries were stripped of their human rights.（增译物主代词）

⑤ 只许州官放火，不许百姓点灯。

While the magistrates were free to burn down house, the common people were forbidden to light lamps.（增译连词）

⑥ 这是我们两国人民的又一个共同点。

This is yet another common point between the people of our two countries.（增译介词）

⑦ 在人权领域，中国反对以大欺小、倚强凌弱。

In the field of human rights, China opposes the practice of the big oppressing the small and the strong bullying the weak.（增译暗含词语）