

# 土木建筑 系列英语

中国建筑工业出版社

第三级 计算机与自动化



English  
Series  
in Architecture  
and Civil Engineering

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陈素英 主编

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## 《土木建筑系列英语》第三级 计算机与自动化

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# 致 读 者

土木建筑行业是我国社会主义经济的重要支柱之一。土木建筑行业职工素质如何,对这个行业发展关系极大。全国土木建筑行业职工约 2000 万人,其中工程技术人员和管理人员约 300 万人。随着对外开放的不断扩大,我国同世界各国之间的人员往来、学术交流、信息传播、经济活动以及工程承包等业务日益频繁,土木建筑行业不同领域不同层次的读者,尤其是中青年知识分子,学习和进修英语的要求越来越迫切。奉献在读者面前的《土木建筑系列英语》读本,正是为满足这样的需要而编撰的。

《土木建筑系列英语》是一套结合土木建筑类各专业的英语分级读本,整个系列按文章难度分为四级。第一、二级,不分专业,内容为土木建筑方面的浅显易懂的科学普及文章。第三级暂分八个专业,即建筑学与城市规划、工业与民用建筑、给水与排水、供热与通风、道路与桥梁、工程机械、管理工程、计算机与自动化,每个专业一册,其他专业视情况再行编撰;内容为各有关专业一般性的科学普及或科学技术文章。第四级内容选收专业性较强的科学技术文章;目前暂出版建筑学与城市规划、工业与民用建筑专业各一册,其他专业留待以后考虑。

我们在组织和编撰《土木建筑系列英语》时,力求使这套读本具有自己的特点。

首先,起点低。这套系列读本的起点为 1000 个单词。凡初中毕业或具有同等英语程度的读者,都可以从第一级开始自修或听课。这就大大地拓宽读者面,使土木建筑行业多数人员有条件有兴趣利用这套读本来学习英语。

其次,便于自学。编撰的四级读本尽量保持一个较为平缓的“坡度”。全部课文均附参考译文,每个练习都有答案,争取使读者在普通英语的“浅基础”上,一步一步地学会阅读学科英语和专业英语。通过学习第一、二级读本,可以掌握土建类科技英语最常用的 2500 个单词以及阅读科技英语书刊和有关资料所必需的基本语法知识。继之,通过学习第三级读本,可以累计掌握本专业最常用的 3500 个单词和比较系统的英语构词法知识,获得阅读本专业英语书刊和有关资料的能力。最后,通过学习第四级读本,可以累计掌握本专业 4500 个单词和比较全面的英译汉知识;这样,比较流利地阅读和翻译本专业英语书刊和有关资料,就有了比较牢固的语言基础。

这套系列英语读本第一、二级均配有录音磁带,由英、美文教专家朗诵,口音纯正,声质清晰,语调自然,使读者听来亲切、生动。

第三,适应性强。各级英语读本既彼此衔接,又相对独立,可以适应各种不同程度的读者的需要。一般读者如果从第一级学起,循序渐进,持之以恒,每周自修或听课3~4小时,经过一年半左右,便可学完前三级读本,为阅读本专业英语书刊和有关资料创造条件。有意深造的读者,再用半年左右,攻读第四级读本,就可以达到比较流利地阅读和翻译本专业英语书刊和有关资料的目的。对于英语基础较好的读者,如高等院校高年级学生,可把第一、二级读本作为泛读教材,第三、四级读本作为精读教材来学。对于硕士研究生或具有同等英语程度的工程技术人员,则可直接阅读第三、四级读本;在掌握英语构词法和英译汉技巧方面,这两级读本对他们会有所帮助。而广播电视大学、函大、夜大、职大、业大及有关中等专业学校的学生,也可依照自己的水平和需要,选学有关读本。

第四,语言规范可靠。这套系列读本的全部课文,均选自近年来面世的英语国家的出版物。但为了适应系统地学习英语的需要,编撰者对不少课文作了必要的删改和加工;而在删改和加工之后,均送各校聘请的英、美文教专家审阅,使之保持规范的科普或科技文体的现代英语的特点。全部练习均由编撰者按统一要求编写,目的在于帮助读者更好地掌握课文中重要的语言材料。全部参考译文均由有关专业教师一一校阅,术语比较准确,行文比较通达。

《土木建筑系列英语》读本是集体智慧的结晶。十几所土木建筑高等院校的五十多位英语教师和专业教师参加了编撰、审订工作,其中某些分册还聘请校外的有关专家过目。哈尔滨建筑工程学院、重庆建筑工程学院、北京建筑工程学院、沈阳建筑工程学院、吉林建筑工程学院、南京建筑工程学院、山东建筑工程学院、西北建筑工程学院、苏州城市建设环境保护学院和河北建筑工程学院等,都对编撰、审订工作表示关怀和支持。

本书内容选自计算机与自动化方面的科学普及出版物。在编撰过程中,承蒙山东工业大学李震东,山东工业大学英籍教师 Matthew Watkins 提出许多宝贵意见,对此,我们表示深切的谢意。

目前,尚未见到紧密结合本学科、本专业编撰的系列英语分级读本,我们只是做了初步的尝试。万事开头难。尽管编撰、审订人员做了大量的细致的工作,但这套《土木建筑系列英语》读本还不是尽善尽美,毫无瑕疵的。我们期待着读者和同行们的批评和指正。

《土木建筑系列英语》编审委员会  
中国建筑工业出版社编辑部  
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# Lesson 1

## Electrical Engineering (1)

As early as the latter part of the 16th century, experimenters were exploring the behavior of static electricity. W. Gilbert experimented with electric charges and discharges. In 1750 Benjamin Franklin proved that lightning was electrical in nature. Neither investigator discovered anything that was significant from the standpoint of the applications of electricity. Discovery of the presence of magnetism in certain rocks preceded the earliest knowledge of electricity. Such knowledge was common about 600 B. C. Applications of electrical knowledge were completely absent in this era.

In 1800 A. Volta discovered the principle of the electric battery. The voltaic cell was one of the most important discoveries in the history of the electrical art, because it provided a continuous source of appreciable amounts of electric power at reasonably low voltage. It was an essential component of the early communication systems, such as the telephone and telegraph.

The first United States patent on the electrical telegraph was obtained by J. Groat in 1800. The invention of a practical electromagnet was announced by Joseph Henry in 1827. These inventions by Groat and Henry opened the way for a still more significant invention, the electromagnetic telegraph.<sup>①</sup> The principle of this forerunner of the communications industry was conceived in 1831, proven practical in 1837, and patented in 1840 by Samuel F. B. Morse.<sup>②</sup>

Few developments have had greater impact on American life than Morse's invention. His idea paved the way for the first system of electrical communication, the telegraph.<sup>③</sup> This in turn led to the telephone and later to the wireless telegraph.<sup>④</sup>

The discovery of electromagnetic induction by Michael Faraday in 1831 established many principles upon which modern machines function.

Motors, generators, transformers, and many other electrical devices found in heavy electrical industry were made possible by the discoveries of Faraday.<sup>⑤</sup> The contributions of Faraday in the electrical power industry are comparable to those of Morse in the field of communications.<sup>⑥</sup>

One of the first important developments based on the disclosures of Faraday was the electric dynamo. English patent no. 1858 describes the principle of operation. In the following years many types of dc generators were developed and used commercially. The Gramme-ring armature was one of the first used in conjunction with a commutator. This machine was somewhat inefficient, but it provided a source of relatively high voltage at a reasonably large power capacity (up to 100 kW).

With the development of the high-resistance carbon filament lamp by Thomas Edison in 1880, the dc generator became one of the essential components of the constant-potential lighting system. Commercial lighting and residential lighting became practical and the electric light and power industry was born. One of the most common uses for direct current during this period was for street lighting.

The first transformer was announced in 1883. This device probably did more to revolutionize the systems of power transmission than any other. The advantages of high-voltage low-current systems over the low-voltage high-current systems of power transmission were well known.<sup>⑦</sup> Following the discovery of the transformer, power could be generated at low voltages, transformed to higher voltages for transmission over great distances (several hundred miles), and then reduced by transformers to lower values for utilization.

In 1888 N. Tesla was granted a patent on the polyphase ac induction motor, which soon became the most commonly used motor for supplying large amounts of power; in its improved state, it is most extensively used today.

In 1876 Alexander Graham Bell invented the telephone. This device was soon put into use and, as a result, another huge industry was established.

## New Words

1. static [ˈstætɪk] *a.* 静态的  
static electricity 静电
2. physician [ˈfɪziʃən] *n.* 医生
3. charge [tʃɑːdʒ] *n.* 充电, 电荷
4. discharge [disˈtʃɑːdʒ] *n.* 放电
5. lightning [ˈlaɪtnɪŋ] *n.* 闪电
6. significant [sɪɡˈnɪfɪkənt] *a.* 有意义的
7. magnetism [ˈmæɡnɪtɪzəm] *n.* 磁, 磁力
8. precede [pri(:)ˈsiːd] *vt.* 先于
9. era [ˈɪərə] *n.* 时代
10. patent [ˈpeɪtənt] *n.* 专利  
patent on 关于…的专利
11. announce [əˈnaʊns] *vt.* 宣布, 宣告
12. electromagnet [ɪˈlektreɪmæɡnɪt] *n.* 电磁铁
13. forerunner [ˈfɔːrʌnə] *n.* 先驱(者)
14. conceive [kənˈsiːv] *vt.* 设想  
be conceived 被陈述, 被表达
15. impact [ˈɪmpækt] *n.* 影响  
have impact on 对…有影响
16. induction [ɪnˈdʌkʃən] *n.* 感应  
electromagnetic induction 电磁感应
17. disclosure [dɪsˈkləʊʒə] *n.* 揭开
18. dynamo [ˈdaɪnəməʊ] *n.* 发电机
19. dc (=direct current) 直流电
20. commercially [kəˈmɜːʃəli] *ad.* 商业上
21. armature [ˈɑːmətʃʊə] *n.* 电枢, 转子
22. conjunction [kənˈdʒʌŋkʃən] *n.* 连接  
in conjunction with 连同…一起
23. commutator [ˈkɒmjuteɪtə] *n.* 整流子, 换向器
24. inefficient [ˌɪnɪˈfɪʃənt] *a.* 低效率的
25. kW (=kilowatt(s)) 千瓦
26. filament [ˈfɪləmənt] *n.* 灯丝
27. potential [pəˈtenʃəl] *a.* 电势的, 电位的  
*n.* 电势, 电位
28. residential [reziˈdenʃəl] *a.* 住宅的
29. revolutionize [ˌrevəˈljʊːʃənaɪz] *vt.* 彻底改革
30. transmission [trænzˈmɪʃən] *n.* 传输
31. grant [ɡrɑːnt] *vt.* 给予
32. polyphase [ˈpɒlɪfeɪz] *a.* 多相的

33. ac (=alternating current)

交流电

polyphase ac induction motor

多相交流感应式电动机

W. Gilbert ['gɪlbət] W·吉尔

伯特

J. Groat [grəʊt] J·格罗特

Joseph Henry ['dʒəʊzɪf '

henri] 约瑟夫·亨利

Samuel F. B. Morse

['sæmjʊəl 'mɔ:s] 塞缪尔F·

B·莫尔斯

Michael Faraday ['maɪkl '

færədi] 迈克尔·法拉第

J. D. Gibbs [gɪbz] J·D·吉

布斯

N. Tesla ['teslə] N·台斯拉

Alexander Graham Bell

[æli'gʒɑ:ndə 'greɪəm 'bel] 亚

历山大·格雷厄姆·贝尔

## Phrases and Expressions

1. experiment with 做…试验

2. in nature 性质上

3. from the standpoint of 从…  
的观点来看

4. be comparable to 比得上

5. in the field of 在…方面

6. over great distances 远距离

7. reduce…to 把…降低到,使…  
变为

## Notes

① These inventions…opened the way for a still more significant invention, the electromagnetic telegraph.

句中 invention 是可数名词,作“发明物”解; the electromagnetic telegraph 是 a still more significant invention 的同位语,对其加以具体说明。

② The principle of this forerunner of the communications industry was conceived in 1831, proven practical in 1837, and patented in 1840 by Samuel F. B. Morse.

句中 conceived, proven, patented 是三个并列的过去分词,分别同助动词 was 构成被动语态,按所表示的动作发生次序排列; communications industry: 作定语用的名词通常用单数形式,但 communication 此用时,常用复数形式; be proven practical: practical 是主语的补语。

③ … the first system of electrical communication, the telegraph.

the telegraph 作 the...system...的同位语。

- ④ This ... led to the telephone and later to the wireless telegraph.  
lead to: “导致”。第二个to前省去 led。
- ⑤ ... and many other electrical devices ... were made possible ...  
possible 是主语的补语。
- ⑥ ... those of Morse in the field of communications.  
those 指代 the contributions。
- ⑦ The advantages of high-voltage low-current system of the low-voltage high-current systems of power transmission ...  
the advantages of A over B: A优于B之处。  
of power transmission 同时修饰 the low-voltage high-current system 和 high-voltage low-current system。

## Exercises

### I. Refer to the text and choose the best alternative (a, b or c) under each question.

- As early as the latter part of the 16th century, \_\_\_\_\_.  
a) no one had discovered the existence of magnetism  
b) no one knew anything about electricity  
☒ c) people knew nothing about the applications of electricity
- The electric battery discovered by Volta had the advantage of providing a continuous source at fairly \_\_\_\_\_.  
a) low cost b) low voltage c) low current
- Michael Faraday made great contributions to the electrical power industry and his discoveries \_\_\_\_\_.  
a) were followed by the invention of the electric dynamo  
b) were preceded by the development of the high-resistance carbon filament lamp  
☒ c) were preceded by the invention of the electric dynamo
- The first transformer was a very important device \_\_\_\_\_.  
a) in the generation of electric energy  
b) in the invention of electric lamps  
☒ c) in the systems of power transmission

5. In 1888 \_\_\_\_\_ patented the polyphase ac induction motor.
- Michael Faraday
  - N. Tesla
  - Alexander Graham Bell

II. Fill in the blanks with suitable phrases from the list given. Change the form of the verbs where necessary.

in the field of	compare ... to
in turn	have impact on
lead to	put ... into wide use
over long distance	pave the way for
reduce ... to	in series

- Heat powers the gas turbine which, in turn, powers the generators.
  - Although plastics has put into wide use, cotton is still occasionally employed as an insulator.
  - We can compare the motion of electrons to the flow of water.
  - Experiments that have modern television took place more than a hundred years ago.
  - Electronics has improved our lives in many ways. The use of electronic devices has made our work easier and safer.
  - When several resistors are connected in series, the equivalent resistance of the combination is equal to the sum of the resistances of the individual resistors.
  - In scientific research, lasers are being used in developing advanced energy resources.
  - Low voltage transformers reduce 120V line voltage to a safe shock-free 12V.
  - It is possible to transmit electrical power over long distance without much energy loss by means of a transformer.
  - Faraday's basic idea of electric and magnetic fields has paved the way for modern field theory.
- III. 1. The extremely common suffix *-ly* forms adverbs from the corresponding adjectives, e.g. *commercially* from *commercial*.



Form adverbs from the following words, making appropriate changes of letters where necessary.

reasonable	absolute
relative	active
essential	complete
extensive	extreme

2. The suffix *-ize* forms verbs from the corresponding nouns and adjectives, e.g. *revolutionize* from *revolution*; *realize* from *real*.

Form verbs from the following words.

standard	special
industrial	modern
magnet	organ