新编工程英语

高等教育应用型重点专业规划教材

New English Course in Engineering

丛书主编　冯光华

王　莹　周　丹　严红烨　主　编
李　萍　副主编

天津大学出版社
TIANJIN UNIVERSITY PRESS

高等教育应用型重点专业规划教材

New English Course in Engineering

新编工程英语

丛书主编：冯光华

主编：王　莹　周　丹　严红烨

副主编：李　萍

天津大学出版社
TIANJIN UNIVERSITY PRESS

图书在版编目（CIP）数据

新编工程英语 / 王莹，周丹，严红烨主编. —天津：天津大学出版社，2018.5
高等教育应用型重点专业规划教材 / 冯光华主编

ISBN 978-7-5618-6129-5

Ⅰ. ①新… Ⅱ. ①王… ②周… ③严… Ⅲ. ①工程技术－英语－高等学校－教材 Ⅳ. ①TB

中国版本图书馆 CIP 数据核字（2018）第 103944 号

出版发行 天津大学出版社
地　　址 天津市卫津路 92 号天津大学内（邮编：300072）
电　　话 发行部：022-27403647
网　　址 publish.tju.edu.cn
印　　刷 天津泰宇印务有限公司
经　　销 全国各地新华书店
开　　本 185mm×260mm
印　　张 8.25
字　　数 230 千
版　　次 2018 年 5 月第 1 版
印　　次 2018 年 5 月第 1 次
定　　价 26.00 元

丛书编委会

总主编：冯光华

编　委：（排名不分先后）

吴海燕　田　娟　房明星　陈　斯　胡　杨　严红烨
蔡丽慧　王电兴　陈　招　王　莹　李璐瑶　左　帆
李　游　杨永华　罗　莉　李　杨　张馨引　李丽花
张　慧　黄亚楠　王　晓　潘婷婷　陈　霞　李　娈
陈　霞　芦　佳　蔡　喆　黄　莉　王华英　胡　玲
孙川慧　张培芳　管春梅　刘　丽　薛海琴　贾　文
李　萍　关荆晶　何丽荣　毛兆婷　段友国　周　丹
石立国

《新编工程英语》编委会

主　编：王　莹　周　丹　严红烨

副主编：李　萍

编　者：潘婷婷　胡　杨　杨永华　黄　莉

前言

为了更好地培养适应社会需要的应用技术型复合人才，《新编工程英语》根据编者的教学实践以及工程行业专家的实操经验，遵循“实用为主，够用为度，以应用为目的”的编写原则，紧密结合工程专业职业需求，立足专业前沿，与生产实际紧密结合，以期培养和提高学生实际运用工程英语的语言能力。

全书共分八个实用主题单元，依次为“土木工程专业和课程”“设计过程”“建筑材料”“桥梁”“建筑物类型”“工程造价”“标书和合同”和“施工”。与此同时，单元练习多样化，包含专业词汇（Special Terms）、实用句型（Sentence Patterns）、补全对话、阅读理解和文段翻译五个部分。这些主题单元的设置和练习的编排都紧紧围绕工程专业前沿，以帮助学生掌握英语技能和专业知识，提高学生工程专业英语阅读和翻译能力，培养专业职业素养为目的。《新编工程英语》集职业性、实用性、适时性和趣味性于一体；内容新颖，语言通俗易懂，图文并茂突出了形式上的多样性和直观性。本书最后还附录了各主题单元练习答案以及课文译文，方便学生自学与自查。

《新编工程英语》可作为应用技术型高校工程专业教材供应用技术型高校的师生们使用。

目 录

Unit 1 Civil Engineering

Learning Objectives

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

- √ Grasp the main idea and the structure of the text;
- √ Master the key language points and grammatical structure in the text;
- √ Understand the compulsory and basic courses;
- √ Conduct a series of reading, listening, speaking and writing activities related to the theme of the unit.

Outline

The following are the main sections in this unit.

1. Warm-up Activity
2. Text
3. Words and Expressions
4. Exercises

Terms of Civil Engineering

In this unit, you will learn the meanings of terms listed below.

computer aided design
photogrammetry
pipeline
structural engineering
mapping

Vocabulary

Listed below are some words appearing in this unit that you should make them a part of your vocabulary.

irrigation
drainage
slurry
municipal
excavate
planner

Looking Ahead

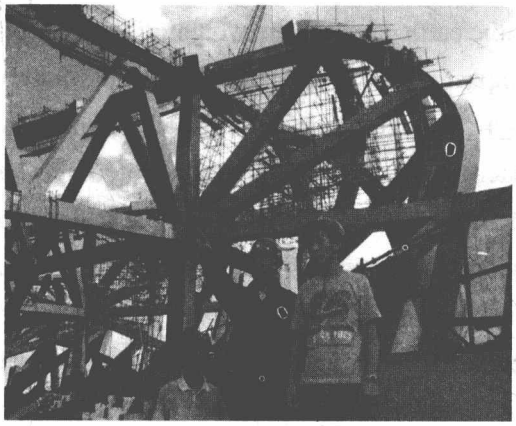
Civil engineers deal with the design and construction of roads, buildings, airports, tunnels, dams, bridges and water supply or sewage systems. This course enables you to progress and qualify as a chartered civil or structural engineer, and provides a strong base of high-quality technical abilities together with good management and personal skills.

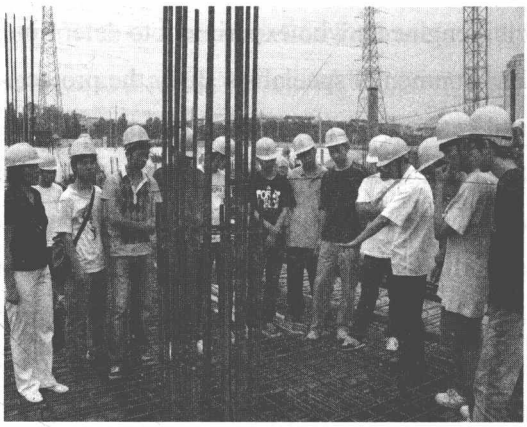
Introduction

Civil engineering is the application of physical and scientific principles for solving the problems of society, and its history is intricately linked to advances in understanding of physics and mathematics throughout history. Because civil engineering is a wide ranging profession, including several separate specialized subdisciplines, its history is linked to knowledge of structures, materials science, geography, geology, soils, hydrology, environment, mechanics and other fields.

Warm-up Activity

What do you think of careers in civil engineering?





Text

Civil Engineering

Civil engineering is the planning, design, construction and management of the built environment. This environment includes all structures built according to scientific principle from irrigation and drainage systems to rocket-launching facilities.

Civil engineers build roads, bridges, tunnels, dams, harbors, power plants, water and sewage systems, hospitals, schools, mass transit, and other public facilities essential to modern society and large population concentrations. They also build privately owned facilities such as airports, railroads, pipelines, skyscrapers, and other large structures designed for industrial, commercial or residential use. In addition, civil engineers plan, design and build complete cities and towns, and more recently have been planning and designing space platforms to house self-contain communities.

The word *civil* derives from the Latin for *citizen*. In 1782, Englishman John Smeaton used the term to differentiate his nonmilitary engineering work from that of the military engineers who predominated at the time. Since then, the term of civil engineering has often been used to refer to engineers who build public facilities, although the field is much broader.

Scope

Because it is so broad, civil engineering is subdivided into a number of technical specialties. Depending on the type of project, the skills of many kinds of civil engineer specialists may be needed. When a project begins, the site is surveyed and mapped by civil engineers who experiment to determine if the earth can bear the weight of the project. Environmental specialists study the project's impact on the local area, the potential for air and groundwater pollution, the project's impact on local animal and plant life, and how the project can be designed to meet government requirements aimed at protecting the environment. Transportation specialists determine what kind of facilities are needed to ease the burden on local roads and other transportation networks that will result from the completed project. Meanwhile, structural specialists use preliminary data to make detailed designs, plans and specifications for the project. Supervising and coordinating the work of these civil engineer specialists, from beginning to end of the project, are the construction management specialists. Based on information supplied by the other specialists, construction management civil engineers estimate quantities and costs of materials and labor, schedule all work, order materials and equipments for the job, hire contractors and subcontractors, and perform other supervisory work to ensure the project is completed on time and as specified.

Throughout any given project, civil engineers make extensive use of computers. Computers are used to design the project's various elements (computer aided design, CAD) and to manage it. Computers are a necessity for the modern civil engineer because they permit the engineer to efficiently handle the large quantities of data needed in determining the best way to construct a project.

Structure engineering In this specialty, civil engineers plan and design structures of all types, including bridges, dams, power plants, supports for equipment, special structures for offshore projects, the United States space program, transmission towers, giant astronomical and radio telescopes, and many other kinds of projects. Using computers, structural engineers determine the forces a structure must resist: its own weight, wind and hurricane forces, temperature changes that expand or contract construction materials, and earthquakes. They also determine the combination of appropriate materials: steel, concrete, plastic, stone, asphalt, brick, aluminum, or other construction materials.

Water resources engineering Civil engineers in this specialty deal with all aspects of the physical control of water. Their projects help prevent floods, supply water for cities and for irrigation, manage and control rivers and water runoff, and maintain beaches

and other waterfront facilities. In addition, they design and maintain harbors, canals, and locks, build huge hydroelectric dams and smaller dams and water impoundments of all kinds, help to design offshore structures, and determine the location of structures affecting navigation.

Geotechnical engineering Civil engineers who specialize in this field analyze the properties of soils and rocks that support structures and affect structural behavior. They evaluate and work to minimize the potential settlement of buildings and other structures that stems from the pressure of their weight on the earth. These engineers also evaluate and determine how to strengthen the stability of slopes and fills and how to protect structures against earthquakes and the effects of groundwater.

Pipeline engineering In this branch of civil engineering, engineers build pipelines and related facilities which transport liquids, gases, or solids ranging from coal slurries (mixed coal and water) and semi liquid wastes, to water, oil, and various types of highly combustible and noncombustible gases. The engineers determine pipeline design, the economic and environmental impact of a project on regions it must traverse, the type of materials to be used— steel, concrete, plastic, or combinations of various materials, installation techniques, methods for testing pipeline strength, and controls for maintaining proper pressure and rate of flow of materials being transported. When hazardous materials are being carried, safety is a major consideration as well.

Environmental engineering In this branch of engineering, civil engineers design, build, and supervise systems to provide safe drinking water and to prevent and control pollution of water supplies, both on the surface and underground. They also design, build, and supervise projects to control or eliminate pollution of the land and air. These engineers build water and waste water treatment plants, and design air scrubbers and other devices to minimize or eliminate air pollution caused by industrial processes, incineration, or other smoke-producing activities. They also work to control toxic and hazardous wastes through the construction of special dump sites or the neutralizing of toxic and hazardous substances. In addition, the engineers design and manage sanitary landfills to prevent pollution of surrounding land.

Transportation engineering Civil engineers working in this specialty build facilities to ensure safe and efficient movement of both people and goods. They specialize in designing and maintaining all types of transportation facilities, highways and streets, mass transit systems, railroads and airfields, ports and harbors. Transportation engineers apply technological knowledge as well as consideration of the economic, political, and

social factors in designing each project. They work closely with urban planners, since the quality of the community is directly related to the quality of the transportation system.

Construction engineering Civil engineers in this field oversee the construction of a project from the beginning to the end. Sometimes called project engineers, they apply both technical and managerial skills, including knowledge of construction methods, planning, organizing, financing, and operating construction projects. They coordinate the activities of virtually everyone engaged in the work: the surveyors; workers who lay out and construct the temporary roads and ramps, excavate for the foundation, build the forms and pour the concrete; and workers who build the steel framework. These engineers also make regular progress reports to the owners of the structure.

Community and urban planning Those engaged in this area of civil engineering may plan and develop community within a city, or entire cities. Such planning involves far more than engineering consideration; environmental, social, and economic factors in the use and development of land and natural resources are also key elements. These civil engineers coordinate planning of public works along with private development. They evaluate the kinds of facilities needed, including streets and highways, public transportation systems, airports, port facilities, water-supply and waste water-disposal systems, public buildings, parks, and recreational and other facilities to ensure social and economic as well as environmental well-being.

Photogrammetry, surveying, and mapping The civil engineers in this specialty precisely measure the Earth's surface to obtain reliable information for locating and designing engineering projects. This practice often involves high-technology methods such as satellite and aerial surveying, and computer processing of photographic imagery. Radio signal from satellites, scans by laser and sonic beams, are converted to maps to provide far more accurate measurements for boring tunnels, building highways and dams, plotting flood control and irrigation project, locating subsurface geologic formations that may affect a construction project, and a host of other building uses.

Other specialties

Two additional civil engineering specialties that are not entirely within the scope of civil engineering but are essential to the discipline are engineering management and engineering teaching.

Engineering management Many civil engineers choose careers that eventually lead to management. Others are able to start their careers in management positions. The civil engineer-manager combines technical knowledge with an ability to organize and

coordinate worker power, materials, machinery, and money. These engineers may work in government — municipal, county, state, or federal; in the U.S. Army Corps of Engineers as military or civilian management engineers; or in semiautonomous regional or city authorities or similar organizations. They may also manage private engineering firms ranging in size from a few employees to hundreds.

Engineering teaching The civil engineer who chooses a teaching career usually teaches both graduate and undergraduate students in technical specialties. Many teaching civil engineers engage in basic research that eventually leads to technical innovations in construction materials and methods. Many also serve as consultants on engineering projects, or on technical boards and commissions associated with major projects.

Words and Expressions

planning	['plænɪŋ]	*n.* 计（规）划
irrigation	[ˌɪrɪ'geɪʃn]	*n.* 灌溉
drainage	['dreɪnɪdʒ]	*n.* 排水
launch	[lɔ:ntʃ]	*vt.* 发射
sewage	['su:ɪdʒ]	*n.* 污水，（下水道里的）污物
pipeline	['paɪplaɪn]	*n.* 管道
skyscraper	['skaɪskreɪpə(r)]	*n.* 摩天大楼
residential	[ˌrezɪ'denʃl]	*adj.* 住宅的
predominate	[prɪ'dɒmɪneɪt]	*vt.* 支配，在……中占优势
specialty	['speʃəltɪ]	*n.* 专业
placement	['pleɪsmənt]	*n.* 放置、安置
sewer	['su:ə(r)]	*n.* 污水管
geotechnical	[ˌdʒi:əu'teknɪkəl]	*adj.* 土工技术的，岩土工程技术的
specification	[ˌspesɪfɪ'keɪʃn]	*n.* 规格，说明书
contractor	[kən'træktə]	*n.* 承包人
subcontractor	[ˌsʌbkən'træktə(r)]	*n.* 转包商
supervisory	['sju:pəˌvaɪzərɪ]	*adj.* 管理（监督）的
computer aided design		计算机辅助设计
structural engineering		结构工程
offshore	[ɒf 'ʃɔ:]	*adj.* 近海的

astronomical	[æstrə'nɒmɪk(ə)l]	*adj.* 天文（学）的
hurricane	['hʌrɪkən]	*n.* 飓风
asphalt	['æsfælt]	*n.* 沥青
runoff	['rʌnɒf]	*n.* 径流，流走的东西
lock	[lɒk]	*n.* 水闸
impoundment	[ɪm'paʊndmənt]	*n.* 蓄水
settlement	['se(ə)tlm(ə)nt]	*n.* 沉淀
scrubber	['skrʌbə]	*n.* 洗涤器
incineration	[ɪn,sɪnə'reɪʃn]	*n.* 焚化
toxic	['tɒksɪk]	*adj.* 有毒的
hazardous	['hæzədəs]	*adj.* 有危险的
neutralize	['nju:trəlaɪz]	*v.*（使）中和
dump	[dʌmp]	*n.* 垃圾场
sanitary	['sænɪt(ə)rɪ]	*adj.*（环境）卫生的
airfield	['eəfi:ld]	*n.*（飞）机场
planner	['plænə]	*n.* 规划人员
slurry	['slʌrɪ]	*n.* 泥浆，残渣
combustible	[kəm'bʌstɪ(ə)bl]	*adj.* 易燃的
oversee	[,əʊvə'si:]	*v.* 监督，管理
managerial	[mænə'dʒi:rɪəl]	*adj.* 管理的
surveyor	[sə'veɪə]	*n.* 测量员
ramp	[ræmp]	*n.* 斜坡
excavate	['ekskəveɪt]	*v.* 挖掘
recreational	[,rekrɪ'eɪʃənl]	*adj.* 消遣的
well-being	['wel'bi:ɪŋ]	*n.* 福利，幸福
photogrammetry	[,fəʊtə(ʊ)'græmɪtrɪ]	*n.* 摄影测量法
surveying	[sə'veɪɪŋ]	*n.* 测量
mapping	['mæpɪŋ]	*v.* 绘图
aerial	['eərɪəl]	*adj.* 空中的
photographic	[,fəʊtə'græfɪk]	*adj.* 摄影的
imagery	['ɪmɪdʒ(ə)rɪ]	*n.* 成像
bore	[bɔ:]	*v.* 钻孔
geologic	[,dʒɪə'lɒdʒɪk]	*adj.* 地质的
municipal	[mjʊ:'nɪsɪp(ə)l]	*adj.* 市政的

semiautonomous	[ˌsemɪɔ:'tɒnəməs]	*adj.* 半自治性的
innovation	[ˌɪnə'veɪʃn]	*n.* 革新
consultant	[kən'sʌltənt]	*n.* 顾问
be essential to		对……必要的
derive from		来源于
be used to		被用于
be subdivided into		再被细分
aim at		目的在于
stem from		产生（起源）于
work with		与……一道工作
be related to		与……有关
range from A to B		在 A 到 B 的范围内
along with		与……一道
a host of		许多
within the scope of		在……范围内
serve as		用作，充当

Exercises

Part One : Special Terms

1. differentiate A from B _____
2. impact on _____
3. meet the requirements of _____
4. 工程管理 _____
5. 基础研究 _____
6. 市政工程 _____

Part Two : Situational Conversation

(**Helen:** a visitor **Xiaoli:** a student majoring in civil and industrial architecture)

Helen: You are a student, aren't you?

Xiaoli: Yes, but how did you know?

Helen: I saw it from your words and appearance, as you look very polite and elegant with a pair of glasses.

Xiaoli: You've good eyesight to know what I do.

Helen: Is it so? Can you tell me what major you are studying?

Xiaoli: Civil and industrial architecture.

Helen: How do you think of your major?

Xiaoli: Wonderful. I think I like it very much.

Helen: Why so, young man?

Xiaoli: As you know, all the buildings are set up by hard-working and bright builders from ancient times to the present. They are really great. So I determined to study architecture, and after graduation I am going to be a builder and to build up high buildings and large mansions with my own hands.

Helen: Your dream of building millions of apartments for the country and the people must be realized, young man. I know you enjoy your major, and I believe you must be a top student in your college, and hope you will be a builder of benefiting people.

Xiaoli: Thank you for your encouragement. I am sure to treasure the good chance and to study hard to realize my dream.

Helen: I'm glad to hear that. Can you tell me how many courses there are in your major?

Xiaoli: More than ten, I suppose. Construction material, architecture of houses, construction technique, construction organizations and mechanics, etc., are required courses; while English and political economics, etc., belong to basic courses.

Helen: So many! How do the teachers teach you?

Xiaoli: They seriously clarify the book knowledge from the shallower to the deeper and from the easier to the more advanced, and explain profound theories in simple languages.

Helen: I think it is the so-called programmed instruction. By the way, what about the teaching facilities?

Xiaoli: Very good. The basic theoretical knowledge of architecture is taught mainly in the classroom, while the operational skills are trained and practiced in the modernized

architectural labs as well as on the cooperated construction worksites.

Helen: For vocational colleges, it is effective and practical to integrate theory with practice and to do practice geared to the needs of the jobs. Is your college large?

Xiaoli: Not very large.

Helen: Oh, I know. Would you please show me around your campus?

Xiaoli: It's my pleasure. This way, please!

Helen: Thank you very much.

Notes:

1. "…as you look very polite and elegant with a pair of glasses" 翻译为"因为你戴着一副眼镜，看上去温文而雅。" 此句中的 as 表原因。

2. "Your dream of building millions of apartments for the country and the people must be realized." 翻译为"你建成大厦千万栋，兴邦立国为人民的理想一定能实现。"

3. "required courses" 意为"必修课"，"basic courses" 意为"基础课"。

4. "…from the shallower to the deeper and from the easier to the more advanced" 的意思是"由浅入深，由易到难"。

5. "…it is the so-called programmed instruction" 意思是"这就是所谓的程序教学"。

6. "…the operational skills are trained and practiced in the modernized architectural labs as well as on the cooperated construction worksites" 意思是"操作技能在现代化的建筑实验室以及拥有合作关系的建筑工地得以训练和实践"。

7. "…to integrate theory with practice" 意思为"理论联系实际"。

8. "…to do practice geared to the needs of the jobs" 意思为"对口实习"，"be geared to" 意思是"适应……的需要，面向"。此处，"geared to…" 为过去分词短语作定语修饰"practice"。

Exercise 1: Sentence Patterns

1. Can you tell me what major you are studying?

你能告诉我你现在学什么专业吗?

2. How do you think of /about your major?

你认为你的专业怎么样?

3. I am sure to treasure the good chance and to study hard to realize my dream.

我一定会珍惜机会刻苦学习，实现我的梦想。

4. I am glad to hear that.

我很高兴听到你这么说。