高等职业教育“十三五”规划教材

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新能源专业英语

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西南交通大学出版社

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·成都·

图书在版编目（CIP）数据

新能源专业英语 / 范佩芳，丁燕琼，冯黎成主编.
—成都：西南交通大学出版社，2017.6
ISBN 978-7-5643-5489-3

Ⅰ. ①新… Ⅱ. ①范… ②丁… ③冯… Ⅲ. ①新能源
－英语－高等职业教育－教材 Ⅳ. ①TK01

中国版本图书馆 CIP 数据核字（2017）第 134462 号

新能源专业英语

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责任编辑	赵玉婷
助理编辑	张文越
封面设计	墨创文化
出版发行	西南交通大学出版社 （四川省成都市二环路北一段 111 号 西南交通大学创新大厦 21 楼）
发行部电话	028-87600564　028-87600533
邮政编码	610031
网址	http://www.xnjdcbs.com
印刷	成都中铁二局永经堂印务有限责任公司
成品尺寸	170 mm × 230 mm
印张	8
字数	179 千
版次	2017 年 6 月第 1 版
印次	2017 年 6 月第 1 次
书号	ISBN 978-7-5643-5489-3
定价	24.00 元

课件咨询电话：028-87600533
图书如有印装质量问题　本社负责退换

前　言

高职院校以理论与实践结合的一体化教学为中心，以不断提高学生的动手、动脑以及手脑并用的能力为目的为社会培养高素质、技能型人才。随着新能源专业飞速发展，用人单位对新能源专业人才提出了更高的要求，毕业生不仅要有一定的专门技能，还要具备包括行业英语在内的其它综合技能。特别是国际间的合作、交流日益频繁，对于国外先进技术的英文资料，专业技术人员要有一定专业英语知识和翻译的能力。

高职院校新能源专业英语的教学目标主要是拓展学生专业词汇量，使学生熟悉本领域内的专业术语，阅读各种相关外文资料，掌握专业英语翻译技巧，了解新能源专业的最新的发展趋势，初步具备用英语进行专业沟通的能力。

专业英语既是一门英语的语言课，又具有专业课的特点，是从基础英语阶段到应用英语阶段的过渡，也是语言学习到信息交流的发展。本书在编写之前对部分高职院校新能源类专业在校学生和专业英语任课教师进行了问卷调查和访谈，深入地了解高职院校新能源专业英语课程的教学现状，以探索新能源专业英语教学改革和实践，并培养学生在专业英语方面的技能。该研究已于 2016 年作为新能源类专指委“十三五”规划课题立项（课题号：XNY2016008），本书的主编范佩芳是该课题的主持人。

本书依照“教、学、做”一体的专业英语课程教学大纲，针对高职院校新能源专业学生的专业和英文基础以及接受能力，教材内容难度适中，实用性强，力求做到“现在所学”与“职业所有”接轨。

全书共分为六个单元，每个单元包括 Warm-up、Task1、2、3、4、5 以及 Extended reading 和 Translation skill 几个部分，语言难度适中，既兼顾英语基础较薄弱的学生，也给学有余力的同学留有自学提高的空间。本教程可供高职院校新能源专业学生使用，也可供高职院校学生素质拓展课程和选修

课程使用。

本书的编写得到了酒泉职业技术学院新能源系和新能源研究院的相关领导和教师的大力帮助和支持，在此，向他们表示衷心的感谢。同时对书中引用文章的作者致以真诚的谢意。

由于作者水平有限，编写仓促，书中难免有疏漏之处，恳请读者提出批评和修改意见，以便今后改进。

编　者

2017 年 6 月

Contents

Unit 1

Making machines

- The reason of making machines.
- Simple machines and powering machines.
- Machines of the industrial revolution.
- Machines in the modern world.

The history of making machines.

Discuss in pairs. Can you introduce the following scientific principles shown in Fig.1-1~Fig.1-4?

Fig.1-1 Simple lever

Fig.1-2 Wheel and axle

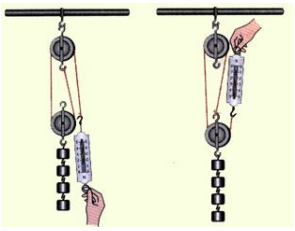

Fig.1-3 Pulley

Fig.1-4 Screw

Task 1 Why did the human being make machine

The human body is perhaps the greatest and most versatile machine ever developed. Our skeleton works like an elaborate collection of levers and pulleys that can lift heavy objects and move at different speeds in a way that defies even the most advanced robots.

Despite its great versatility, the human body has its limits, which cap how fast we can run, how much we can lift, and how much work we can do before we tire. For all the wonders of the human body, the development of modern society has relied very heavily on artificial machines to replace muscle power. An android is a robot built to match the human body, with arms and legs. Even this advanced android cannot move as quickly as a human, although it does not get tired or bored when working.

The earliest machines were prehistoric hand tools. Eyebrow tweezers (based on the lever) date from around 3 500 B.C. in the ancient Sumerian civilization (in what is now Iraq). Most of the earliest agricultural tools also used the principle of the lever, including the shears (invented around 4500 B.C.) and the plow (in use by 3000 B.C.).The first machine ever invented was the hand axe, a fist-sized tool used to cut meat by Stone Age humans.

versatile ['vəːsətaɪl] *adj.*（指工具、机器等）多用途的；多功能的

skeleton ['skelɪtn] *n.*（建筑物等的）骨架；骨骼

elaborate [ɪ'læbəreɪt] *vi.* 详尽说明

adj. 复杂的；精心制作的

lever ['liːvə] *n.* 杠杆；操作杆；工具

pulley [ˈpʊli] *n*. 滑轮（组），皮带轮
v. 用滑轮升起
defy [dɪˈfaɪ] *vt*. 不服从；向……挑战
n. 挑战；对抗
artificial [ˌɑːɪˈfɪʃəl] *adj*. 人造的；人工的，非原产地的
n. 人造肥料
principle [ˈprinsəpl] *n*. 原则，原理；准则，道义；道德标准；本能
shear [ʃiə] *vt*. 切断；剥夺
n. 大剪刀；剪切；[力]切力
plow [plaʊ]n.犁；犁型铲雪机
eyebrow tweezers　眉毛钳
Sumerian civilization　苏美尔文化
Stone Age　石器时代

Task 2　Simple machines

Strictly speaking, a machine does not have to be a large and noisy contraption made of engines, gears, and wheels. It can be any device that converts a small force into a large one. Simple machines include crowbars, scissors, wedges, and screws. Machines transform forces into motion and back again. There are four simple machines: wheel and axle, pulley and screw.

1. A lever is a rigid bar

It pivoted around a point called the fulcrum. The lever transforms a small force (the effort) into a large force (The load). Devices that use the lever principle include scissors, wheelbarrows, tongs, and hammers.

2. A wheel and axle unit

It is effectively a lever, with the axle acting as the fulcrum. If you turn a bicycle wheel by spinning the axle at the center, the outside of the wheel turns much more quickly but with less force.

3. A pulley users

It uses a set of wheels and axles to convert small effort applied over a long distance into a larger load moving a shorter distance.

4. A screw

A screw, such as that used in a car jack, is like an inclined plane wapped

around itself. (The handle of the jack is also often a lever.)

The mechanical advantage of a machine is a measure of how useful it is. For example, a pulley with four ropes has a mechanical advantage of four, which means it could be used to lift a load of twenty pounds with a force equivalent to just five pounds.

Greek inventors were the original mechanics; the word machine comes from the Greek word “mechane”, which translates loosely as “device”. The Greeks pioneered the use of mechanical dolls and toys called automata . Although automata were designed for amusement, their ingenious mechanisms inspired many later inventions.

contraption [kənˈtræpʃn] *n*. 奇妙的装置，新发明

convert [kənˈvəːt] *vt*.（使）转变；兑换

n. 皈依者

crowbar [ˈkrəʊbɑː(r)] *n*.铁撬棍

scissors [ˈsɪzəz] *n*.剪刀

v. 剪开(scissor 的第三人称单数)

wedge [wedʒ] *n*. 楔；楔形物

vt. 楔入

screw [skruː] *n*. 螺丝钉；螺旋桨，螺旋状物

vt. 用螺丝拧紧

axle [ˈæksl] *n*.车轴；轮轴；轴端

pivot [ˈpɪvət] *n*. 枢轴；中枢；[物]支点

tong [tɒŋ] *n*. 堂；钳

v. 用钳子钳起

fulcrum [ˈfʊlkrəm] *n*. 支撑杠杆的点，支点

equivalent [ɪˈkwɪvələnt] *adj*. 相等的

n. 对等物；[化学]当量

Task 3　Powering machines

Water mills were used to power a variety of different machines. From the first century A.D. the Chinese were using water mills to make paper, and

water-powered mechanical hammers were in use 200 years later. The use of water power spread rapidly toward the end of the Roman Empire. By the end of the Roman Empire, machines used levers, wheels, pulleys, winches, gears, which were driven by animals, humans, and water. Form this time until the Industrial Revolution in the 19th century, machines became more complex and more refined.

Fig.1-5 Old-style windmill

An old windmill was built to grind grain into flour.

The windmill shown in Fig.1-5 was designed to mill grain. Other windmills have been designed to pump water out of fields or to generate electricity. This mill has four large, wooden sails arranged in a cross. Attached to the center of this cross shape inside the windmill is the windshaft–a sturdy wooden axle that supports the sails and turns with them. The sails are of a type known as spring sails–they have small wooden shutters that blow open when the wind is strong, preventing the sails from bending and spinning around too quickly. As the wind blows, the sails rotate, turning the brake wheel, which in turn rotates a series of gears, starting with the wallower. The wallower turns the great spur wheel, which turns the gears that move the millstones on either side. The millstones are large, circular stones with a hole in the middle. Grain poured into the hole is crushed under the heavy wheel, becoming flour.

rotation [rəʊˈteɪʃən] *n*. 旋转，循环；[天]自转

reciprocating [rɪˈsɪprəkeɪtɪŋ] *adj*. 往复的；摆动的

v. 报答，酬答(reciprocate 的现在分词)

cam [kæm] *n*. 凸轮

crank [kræŋk] *n*. [机]曲柄；

vt. 转动曲柄移动；转动曲柄开动（引擎）

attach [əˈtætʃ] *vt*. & *vi*. 贴上，附上

vi. 从属；附着；联在一起(to, upon)

wind shaft　风矢杆

wallower　打滚者；沉溺者；纵乐者

Task 4　Machines of the industrial revolution

The Industrial Revolution was more of a gradual transition from the age of hand tools to societies that run on machines. It began in Britain around 1750 and has been spreading around the world ever since.

Machines changed in two basic ways during this time. First, a series of innovations in textile manufacture in Britain led to much more highly automated machines that enabled a single worker to produce a much greater output. Second, there was a revolution in the way in which machines were powered. Until this time, large-scale machines had been powered by water, and were built next to rivers. But the development of the steam engine meant that machines could be built anywhere they were needed. Steam engines (and the internal-combustion gasoline and diesel engines that replaced them) relied on the crank and connecting rod to transform the up-and-down motion of a piston in a cylinder into rotational motion that could drive a wheel.

Oliver Evans was a pioneer of mechanization, where machines do the jobs once done by people. At the age of 25, Evens joined his two brothers at their flour mill in Philadelphia. He transformed the mill with water-powered machines, including bucket elevators and conveyors for raising the grain, auger screws to move it along horizontally, and automatic rakes to smooth it out. The beauty of the Evens mill was that each machine passed something on automatically to the next machine in the sequence without any need for human intervention. Grain

was fed in at one end, and flour emerged at the other. This, the first ever production line, reduced the cost of the operation by as much as 50 percent.

Even before the Industrial Revolution group of people were challenging the idea that machines automatically bring benefits to society. Perhaps the best-known opposition to machines came from the Luddits in Britain during the Industrial Revolution. In 1881 this band of angry textile workers smashed up the new machines that they feared would take away their jobs. Their violent revolt spread through central England for four years, and only ended when the rioters were deported to Australia or hanged. One of the best-known assaults on the machine age was the film *Modern Time*, first shown in 1936, in which Charlie Chaplin is shown wrestling hilariously with machines on a production line.

evolution [ˌi:vəˈlu:ʃən] *n*. 演变，进化论；（天体的）形成；（气体等的）放出

innovation [ˌɪnəʊˈveɪʃən] *n*. 改革，创新；新发明

automate [ˈɔ:təˌmeɪt] *vt*.& *vi*.（使）自动化；使自动操作

output [ˈaʊtpʊt] *n*. 输出；作品；[计]输出信号

vt. 输出

cylinder [ˈsɪlɪndə] *n*. 圆筒，汽缸；（尤指用作容器的）圆筒状物

smash [smæʃ] *vt*. 打碎；撞击；猛扣（球等）

vi. 被击碎；扣球，抽杀

violent [ˈvaɪələnt] *adj*. 暴力引起的；剧烈的，（风、爆炸等）猛烈的

revolt [rɪˈvəʊlt] *vt*.（使）厌恶

vi. 反叛，背叛

deport [dɪˈpɔ:t] *vt*. 行为，举动；把……驱逐出境

assault [əˈsɔ:lt] *n*. 攻击；袭击，进攻

wrestle [ˈresl] *vt*.& *vi*.（与某人）搏斗

n. 摔跤；斗争

hilariously[hɪˈlɛərɪsli] *adv*. 滑稽地

Industrial Revolution　工业革命

steam engine　蒸汽机

internal-combustion　内燃机

diesel engine　柴油机

connecting rod　连杆
Luddits　卢德派
Modern Time　摩登时代
Charlie Chaplin　查理`卓别林

Task 5　Machines in the modern world

For all their sophistication, the modern machines that surround us today can be traced back to the simple machines developed by early civilizations. Most are little more than complex assemblages of levers, gears, wheels, and axles. The first machine guns could be used to fire a rapid stream of bullets using a hand crank. The sewing machine was powered by a foot treadle, which rotated the main drive shaft. The drive shaft then used a crank to raise and lower a needle through the cloth. The 19th century cash register used complex arrangements of gears and borrowed the system of lever used in its keyboard from the typewriter. The bicycle uses the wheel and axle and an increasingly sophisticated arrangement of gears.

The capacity of cranes has increased remarkably since ancient times. The treadmill-powered hoists used by the builders of the Roman Empire could lift loads of a few tons. One of the biggest cranes ever made, the Musashi floating crane built in Japan in 1974, can safely lift loads of up to 3000 tons.

Although many of today's machines use electronic controls, some modern machines are barely distinguishable from their ancient counterparts. Cranes still use hoists and pulleys that would not look out of place in ancient Rome. Archimedes' screws are still used in construction machines and on production lines. Even the automatic doors used in shopping malls owe much to the steam-powered temple doors devised by Hero of Alexandria. Owing to inventors throughout history, we can truly marvel at the machines of today.

sophistication [sə,fɪstɪ'keɪʃn] *n*. 精明；强词夺理，诡辩
assemblage [ə'semblɪdʒ] *n*. 装配；聚集；（聚集在一起的）一堆东西
sophisticated [sə'fɪstɪkeɪtɪd] *adj*. 复杂的；富有经验的；深奥微妙的
distinguish [dɪs'tɪŋgwɪʃ] *vi*. 区分，辨别，分清；辨别是非

crane [kreɪn] *n*. 吊车，起重机

vt.& *vi*. 伸长，探头

owe [əʊ] *vt*. 欠……债；感激；应归功于

marvel [ˈmɑːvəl] n.奇迹；令人惊奇的事物

hand crank　手动曲柄

sewing machine　缝纫机

foot treadle　脚踏板

cash register　收银员

Archimedes' screws　阿基米德螺旋

construction machine　工程机械

1. Answer the following questions in English

(1) What does the human have limits?

(2) Why does the human make machine?

(3) What is a lever? What's the function of a lever?

(4) Why is the mechanical advantage?

(5) When and where did the Industrial Revolution begin?

2. Translate the following sentences into Chinese

(1) Our skeleton works like an elaborate collection of levers and pulleys that can lift heavy objects and move at different speeds in a way that defies even the most advanced robots.

(2) For all the wonder of the human body the development of modern society has relied very heavily on artificial machines to replace muscle power.

(3) Even this advanced android cannot move as quickly as a human, although it does not get tired or bored when working.

(4) Most of the earliest agricultural tools also used the principle of the lever, including the shears (invented around 4 500 B.C.) and the plow (in use by 3 000 B.C.).

(5) The first machine ever invented was the hand axe, a fist-sized tool used to cut meat by Stone Age humans.