面向二十一世纪最新科技英语教材

An English Reading Course for Modern Science and Technology

现代科技英语阅读教程

程同春 编著

☆前沿科技动态

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东南大学出版社

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内容提要

本教程系面向21世纪,具有强烈时代气息和体现现代科技英语特色的大学英语阅读教材。课文题材广泛,信息量大,内容新颖,并融思想性、趣味性,可读性和实用性于一体。每单元语篇语言规范,篇幅适中,由浅入深,循序渐进,有利教学,便于自学。每篇英语课文均配有语言点和汉译文(Language Points and Chinese Translations)以及练习(Exercises),全书最后部分还配有五套实践练习题(Practice Exercises))和参考答案,目的是引导读者领会课文重点,掌握常用的现代科技英语专业词汇和短语,通过一定的翻译实践提高科技英语的阅读理解与翻译能力。本教程主要使用对象为高等学校和高等职业技术学院理工类专业高年级学生,也可供科技工作者、理工类专业人员或具有中级英语水平以上的广大英语爱好者学习或培训使用。

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前　言

我们已经进入了21世纪。回顾过去一百年来的历史，世界科学技术迅猛发展，人类在极短的时间内超越了蒸汽机时代，现在已进入了航天时代和信息时代。从收音机、电视、雷达、汽车、飞机到火箭、激光、电子计算机、航天飞机和人造地球卫星，各种科技发明、创造如雨后春笋般涌现，在工农业生产建设、社会经济发展、文化教育、生命科学、太空研究等各个方面大大促进了世界文明和现代化进程，使世界变得更加丰富多彩，也从根本上改变了人类的生活方式。

科技英语作为英语语言属下的一门专业学科，是专门用途英语(English for Specific Purposes，简称ESP)的一种，是将要从事或正在从事科技工作和理工类专业人员所教授或应用的专门用途英语。科技英语作为科技交流的工具和科技信息的载体，以英语语言形式反映世界科学技术研究和发展的成果、方法和动态，其重要性已经并将随着现代科技的突飞猛进而日趋增强。

为了使大学教育面向21世纪，适应现代化社会对理工类专业人才的需求，我们特编写了这本教材。本教材主要编选了国内外近年来有关科技发展的最新资料，选题广泛，内容翔实，从个人计算机、因特网、网络电话到电子商务、网上生活方式；从电子鼻、传播技术、信息技术到信息高速公路、国际空间站；从基因工程、克隆技术、虚拟现实技术到红外摄影机、太空旅游；从生物节奏、环境保护、治理污染到绿色革命、开发新能源，几乎包括了理工类专业的各个领域和各种高新技术。这些文章材料新颖，语言规范，体裁多样，信息量大，实用性强，具有鲜明的时代气息。

本教材的编写原则是：结合语言学习的特点，体现基础英语、专业英语和专业知识的三结合，力求成为一门系统性、指导性、趣味性和可读性较强的课程，有利教学，便于自学。全书共分为30个单元，每单元的课文段落按顺序编号，课文后配有注释和汉译文，以帮助读者理解。每单元课文后的练习题和全书最后部分的五套实践练习题引导读者领会全文重点，掌握一些必要与常用的现代科技英语词汇，并结合进行适量的多项选择、阅读理解和英汉翻译实践，从而提高科技英语的阅读与翻译能力。本书可作为高等学校和高等职业技术学院理工类专业高年级学生教学用书，也可供科技工作者和理工类专业人员阅读、学习之用。

本书可供教学一学年(两个学期)，每周二至四课时。也可由教师根据课时安排情况和学生所学专业的不同，选用相近、相关专业内容的课文，进行有重点的教学。如何进行各个教学环节，建议如下：

一、预习

这是教学的首要环节。学生应在上课前认真进行预习，借助英语词典以及每单元课文后的Language Points and Chinese Translations，充分理解课文内容，通过英语学习相关的专业知识及其英语表达法。

二、课堂教学

这是教学的主要环节，它起着学生学习科技英语的主渠道作用。课堂教学原则上应用英语讲授，也可适当运用汉语，进行英汉两种语言的比较。课堂教学中可以开展如下教学活动：

1. 让学生朗读课文，将课文翻译成汉语，根据课文内容提问等方式检查学生的预习情况

与理解能力。

2. 教师介绍必要的背景知识，讲解一些语言点、重点和难点，以及一些常用的现代科技英语词汇、短语、句型等，同时对一些较难较复杂的句子结构进行必要的语法分析，总之调动一切教学手段达到学生对课文的充分理解与掌握。

3. 在学生掌握课文内容的前提下，有时可组织课堂讨论或分成小组进行活动，就课文内容结合实际各抒己见，相互交流，以提高学生综合理解能力。

4. 课文后的练习题可作为课堂练习，也可作为课外作业，以帮助学生巩固、提高所学的知识。

5. 在教学过程中，教师也可以根据教学内容和学生英语水平的实际情况，结合进行一些必要的科技英语阅读与翻译技巧的讲解，以利提高学生的科技英语实际应用能力，为所学的专业服务。

三、复习

学生应在教师的指导下进行课后复习。复习时，学生要对课文内容有正确的理解；能将课文译成较通顺的中文；能较熟练地说出和应用科技英语的一些常用词汇；掌握与课文内容相关的专业知识；能正确地做课后的各种练习。

程欣同志参与了本书的编写，并为整理文稿做了大量工作。本书编写中吸收了最新的科技研究成果，参考和引用了有关论著、文章，文中不能一一注明，在此向有关作者表示感谢。书中不妥之处，敬请同行专家、广大读者不吝指正。

编者

2000 年 10 月于南京理工大学

CONTENTS

Unit 1

Information Technology

[1]What exactly is infotech? 85% of people polled recently had not a clue what is meant, although 53% of those polled said they thought it sounded pretty important. They were right. It is. So what is it? Well, put simply, it is the "marrying-up" of products from several key industries: computers, telephones, television, satellites. It means using micro-electronics, telecommunication networks, and fibre optics to help produce, store, obtain and send information by way of words, numbers, pictures and sound more quickly and efficiently than ever before.

[2]The impact infotech is having and is going to have on our lives and work is tremendous. It is already linking the skills of the space industry with those of cable television so programmes can be beamed directly into our homes from all over the world. Armies of "steel collar" workers, the robots, will soon be working in factories doing the boring, complex and unpleasant jobs which are at present still done by man. In some areas such as the car industry this has already started. Television will also be used to enable customers to shop from the comfort of their homes by simply ordering via the TV screen, payment being made by direct debit of their credit cards. Home banking and the automatic booking of tickets will also be done through the television screen. Cable television which in many countries now gives a choice of dozens of channels will soon be used to protect our homes by operating burglar and fire alarms linked to police and fire stations. Computers will run our homes, controlling the heating, air conditioning and cooking systems while robots will cope with the housework. The friendly postman will be a thing of the past as the postal service and letters disappear with the electronic mail received via viewdata screens.

[3]All these things are coming very fast and their effects will be as far-reaching as those of the industrial revolution. Infotech is part of the technological revolution and that is with us now.

Language Points and Chinese Translations

第一单元　信息技术

[1]infotech 信息技术，是 information technology 的简写形式/to poll 投票，民意测验，舆论调查，在本句中为过去分词，修饰前面的 people/clue 线索，had not a clue 相当于 did not know/marrying-up 嫁接，结合/key industries 主要工业，基本工业/micro-electronics 微电子学/fibre optics 纤维光学

信息技术究竟是什么？根据最近进行的民意测验表明 85% 的人不知道信息技术是什么，虽然 53% 的被调查者说他们认为这听起来十分重要。他们是对的，确实如此。那么信息技术是什么？简单地说来，它是计算机、电话、电视、卫星等若干主要工业产品的"有机结合"。它指使用微电子学、通讯网络和纤维光学原理，采取词汇、数字、图像和声音的方式，比以前更快速有效地帮助制作、储存、获取和发送信息。

[2]to beam（无线电等）传送，播送/armies of 大批的，成批的/steel collar 是作者模仿 white collar（白领）而创造的一个新词汇，"steel collar" workers "钢领"工人，意指机器人，后面的 the robots 是其同位语/via, prep. 通过，经过，相当于 by the way of/...payment being made by direct debit of their credit cards 是一独立结构，在本句中作状语用/home banking 家庭银行业务/the automatic booking of tickets 自动订票/dozens of channels 几十个电视频道/to run 管理，经营/to cope with 处理，应付/the postal service 邮政服务/electronic mail 电子邮件，现在一般简写为 E－mail/viewdata screen 指提供可视资料与数据的屏幕，即计算机屏幕

信息技术正在和将要对我们的生活和工作产生极其巨大的影响。它正在把太空工业技术和有线电视技术结合起来以便把电视节目直接传送到世界各地、千家万户。大批的"钢领"工人，即机器人，不久将在工厂里做那些枯燥乏味而又复杂的工作，而这些工作目前仍然由人在操作。但在汽车工业等一些领域，已经开始这样做了。电视也可以用来帮助顾客在舒适的家中购物，他们只要通过电视屏幕订货，并用信用卡直接借记付款。也可以通过电视屏幕运作家庭银行业务以及进行自动订票。现在在很多国家有线电视可以提供几十个电视频道供人们选择，这种有线电视不久将被用来操作与警察局、消防站连接的防盗、防火警报装置，从而达到保护家庭的目的。计算机将管理家庭，控制取暖、空调和烹饪系统，而机器人则将处理所有家务劳动。随着邮政服务和信函的消失，以及通过计算机屏幕接收电子邮件，友好可亲的邮递员也将成为历史。

[3]所有这一切事物都将迅速来临，它们的作用将像工业革命一样影响深远。信息技术是技术革命的一部分，现在它已和我们息息相关。

Exercises

一、Answer the following questions:

1. What is infotech?

_____

2. What does infotech mean?

_____

3. What are the impact and the function of infotech?

_____

4. How can we use cable television to protect our homes?

_____

5. How can we use computers to run our homes?

_____

6. Why will the postmen be a thing of the past?

_____

二、Translate the following words and phrases:

A. From Chinese into English.

1. 信息技术_____
2. 主要工业_____
3. 卫星_____
4. 微电子产品_____
5. 通讯网络_____
6. 纤维光学_____
7. 有线电视_____
8. 机器人_____
9. 技术革命_____
10. 电子邮件_____

B. From English into Chinese.

1. to produce, store, obtain and send information _____
2. by way of words, numbers, pictures and sound _____
3. to link...with... _____
4. the skills of the space industry _____
5. the boring, complex and unpleasant jobs _____
6. to order via the TV screen _____
7. credit cards _____
8. dozens of channels _____
9. to cope with the housework _____

10. to control the heating, air conditioning and cooking systems

三、Translate the following passage into Chinese:

Information Technology(IT) has arisen as a separate technology by the convergence of data processing techniques and telecommunications, the former providing the capability for processing and storing information, the latter the vehicle for communicating it. The main contributing branches are computing, microelectronics and telecommunications but others include optoelectronics, office equipment technology, systems theory and artificial intelligence theory and practice.

The rapid advances in telecommunications and computer technology are causing the information and telecommunications industries to converge. Everything is going digital—telephones, televisions, radios. Soon it will be difficult or impossible to distinguish between a cable television company and a telephone company. Both will be providing high-speed, two-way, digital video services as well as ordinary phone service.

Well-known Sayings

△ *Progress begins with the belief that what is necessary is possible.*

△ *Human progress is furthered, not by conformity, but by aberration.*

△ *The people who get on in this world are the people who get up and look for circumstances they want, and if they cannot find them, make them.*

Unit 2

Speeding on the Data Highway

[1]The US's largest telecommunications company has overtaken its rivals in the battle to keep ahead on the information superhighway by sending data down a sub-sea fibre optic cable four times faster than is usual on today's commercial cables. The increased transmission speed was made possible by amplifying the signals optically rather than electronically.

[2]Last month AT&T sent the information as pulses of light at a rate of 10 billion bits per second over a 2000-kilometre stretch of cable under the Caribbean Sea. Although even higher rates have been attained in research the test proves that commercial cables can also be made to work at higher speeds.

[3]Today's fastest commercial fibre optic cables carry 2.5 billion bits per second, but as services such as video phone calls develop, their capacity will have to be increased.

[4]AT&T ran the tests on a cable stretching from Florida to the American Virgin Islands. When fully operational in December, the cable will connect the US, Mexico, Italy, Portugal and Spain. But it will not work at the higher speed immediately because customers do not yet need it.

[5]To transmit information through a fibre optic cable, the signal is converted into pulses of light. As the signal travels down the cable it gradually becomes fainter, so it must be boosted every 40 miles or so. In the past this was achieved by electronic repeaters, which convert the light pulses into electronic signals, boost them, and then convert them back into light before sending them on. But electronic repeaters must be preset to process a certain amount of information. So increasing the capacity of the cable would mean replacing every repeater along its length.

[6]This problem can be avoided by using optical repeaters. These are stretches of cable that contain the light-emitting element erbium and a "pump" laser. The laser keeps the erbium section of fibre at an energy state on the brink of emitting light. This means that when the light pulse hits the erbium section, it boosts the erbium's energy just enough to push it over the edge and emit light, sending the refreshed signal onto the next repeater.

[7]Using a method called wavelength division multiplexing, AT&T's engineers sent four colours of light simultaneously down the cable. The signals were then sorted out according to wavelength and converted back into information.

Language Points and Chinese Translations

第二单元　在信息高速公路上加速

[1]rival 竞争者,对手/sub-sea 海底,海底的,sub 为词的前缀,表示下、低、次等含义。/to amplify 放大,扩大,延伸/signal 信号

美国最大的电信公司通过海底光纤电缆发送信息,其速度比今天的商业电缆快四倍,从而大大超过了其竞争对手,保持了在信息高速公路上的领先地位。该公司通过光学而不是电子学的方法放大信号因而提高了传送速度。

[2]pulses of light 光脉冲波,pulse 脉,脉搏,脉冲波/bit(binary digit) 毕特,二进位制信息单位/stretch 伸长,伸展,延亘,连绵

上个月 AT&T 公司通过加勒比海海底长达2,000公里的光纤电缆,以速度为每秒 100 亿个毕特的光脉冲波输送了信息。虽然在研究中可以达到更高的速度,但是这次测试表明商业电缆也能以更高的速度运行。

[3]video phone 可视电话,电视电话,video 电视的/capacity 容量,容积

今天最快速的商业光纤电缆传送速度为每秒 25 亿个毕特,但是随着可视电话的发展,其容量也将必须增加。

[4]operational 操作上的,运作上的,业务上的

AT&T 公司在佛罗里达州至美属维尔京群岛的海底光纤电缆上作过多次试验。在 12 月全线运行时,这条电缆将把美国、墨西哥、意大利、葡萄牙和西班亚互相连通。但是该电缆不会立即以更高的速度运行,因为用户们还没有这样的需求。

[5]to convert... into... 把……转变成……/to boost 抬高,升高/electronic repeater 电子中继器

为了要通过光纤电缆传送信息,就必须把信号转换成光脉冲。由于信号在沿着电缆运行时会逐渐减弱,因此每隔 40 英里左右,就必须把信号放大一次。这在过去是靠使用电子中继器来实现的。电子中继器把光脉冲转变成电子信号,加以放大,然后再转变成光继续进行传送。但是电子中继器必须预设才能处理一定数量的信息。因此增加电缆的容量就意味着要替换整个电缆上的每个中继器。

[6]erbium 铒/on the brink of 濒于,濒临,在……的边缘/to refresh 提神,振作,更新,本文中 refreshed 作形容词用,修饰 signal,表示"增强的,提高的,扩大的"之意

可以使用光学中继器来避免这个问题。光学中继器是含有发光元素铒和"泵"激光的长段的光缆。激光使光纤电缆的含铒部分处于濒临发光的能量状态。这意指:当光脉冲打击含铒部分时,使铒的能量增加到足以推动它超越边缘能态而发光,这样把增强了的信号传送给下一个中继器。

[7]wave-length 波长/simultaneously 同时,相当于 at the same time/to sort out 拣选,分类

AT&T 公司的工程师们使用波长分隔多路传送的方法,把四种颜色的光同时输入电缆,然后信号就按不同的波长被分拣并转换成信息。

Exercises

一、Answer the following questions:

1. In which respect has the US's largest telecommunications company overtaken its rivals?

2. How fast does a sub-sea fibre optic cable transmit signals?

3. What is the rate of pulses of light?

4. What does the test made by AT&T prove?

5. How is information transmitted through a fibre optic cable?

6. What is an optical repeater?

7. What method do AT&T's engineers adopt to transmit information through a fibre optic cable?

二、Translate the following words and phrases:

A. From Chinese into English.

1. 信息高速公路
2. 电信公司
3. 海底光纤电缆
4. 光脉冲
5. 电视电话
6. 电子中继器
7. 光学中继器
8. 波长

B. From English into Chinese.

1. commercial cables
2. to amplify the signals optically
3. at a rate of
4. at a high speed
5. every 40 miles or so
6. a certain amount of information
7. to convert... into...
8. at an energy state
9. on the brink of

三、Translate the following passage into Chinese:

An undersea fibre optic cable stretching from China to the United States in a loop system more than 25,000 kilometres underwater will soon expand China's links with the world.

This new fibre optic technology system will transmit voice, data and images at up to a total of 80 gigabits per second. The capacity of 80 gigabits per second is a massive speed advance on previous technology, and allows the transmission of more than one million calls simultaneously.

The $1.5 billion China-US Cable Network, as it is called, provides a digital connection between China and the US, and overcomes the small fibre optic capacity which has been available, and which, among other things, affects the ability to expand Internet capacity(currently all links are via satellite). China Telecom has been trying for some time to set up a direct link with the US. The cable will be used for all communications such as telephone line services including Internet connections and e-mail links.

Well-known Sayings

△ *The most incomprehensible thing about the world is that it is comprehensible.*

△ *The trouble with our times is that the future is not what it used to be.*

△ *The natural progress of the works of men is from rudeness to convenience, from convenience to elegance and from elegance to nicety.*

Unit 3

What are Biorhythms?

[1]At the beginning of last century, medical scientists made a surprising discovery: that we are built not just of flesh and blood but also of time. They were able to demonstrate that we all have an internal "body clock" which regulates the rise and fall of our body energies, making us different from one day to the next. These forces became known as biorhythms; they create the "highs" and "lows" in our everyday life.

[2]The idea of an internal "body clock" should not be too surprising, since the lives of most living things are dominated by the 24-hour night-and-day cycle. The most obvious feature of this cycle is the way we feel tired and fall asleep at night and become awake and alert during the day. If the 24-hour rhythm is interrupted, most people experience unpleasant side effects. For example, international aeroplane travellers often experience "jet lag" when travelling across time zones. People who are not used to shift work can find that lack of sleep affects their work performance.

[3]As well as the daily rhythm of sleeping and waking, we also have other rhythms which last longer than one day and which influence wide areas of our lives. Most of us would agree that we feel good on some days and not so good on others. Sometimes we are all fingers and thumbs but on other days we have excellent coordination. There are times when we appear to be accident-prone, or when our temper seems to be on a short fuse. Isn't it also strange how ideas seem to flow on some days but at other times are apparently nonexistent? Musicians, painters and writers often talk about "dry spells".

[4]Scientists have identified the following three biorhythmic cycles: physical, emotional and intellectual. Each cycle lasts approximately 28 days and each is divided into a high energy period and a low energy period of equal length. During the high energy period of a physical biorhythm we are more resistant to illness, better coordinated and more energetic; during the low energy period we are less resistant to illness, less well coordinated and tire more easily. The low period puts energy into our "batteries" for the next high period.

[5]The "critical" or weakest time is the time of changeover from the high energy period to the low energy period or vice versa. This "critical" time usually lasts a day. On the critical day of a physical biorhythm, there is a greater chance of accident and illness.

[6]Human experience is always individual and we each have our own biorhythmic ex-

periences. Some people experience such enormous physical turbulence on their "physically critical" days that they have to go to bed. Accidents appear to happen so frequently during turbulent biorhythms that some car insurance companies in Japan have issued biorhythm forecasts to policy-holders in order to cut down the number of costly incidents.

Language Points and Chinese Translations

第三单元　什么是生物节奏?

[1]to demonstrate 证明,论证,表明/body clock 生物钟/to regulate 调节,调整,控制/biorhythms 生物节奏

在上个世纪初,医学科学家们作出了一个惊人的发现:我们的身体不仅由血、肉构成,而且还包含时间。他们能够证明我们体内都有"生物钟",调节体能的增减,使我们每天的状况各不相同。这种体能力量被称作生物节奏,使我们每天的生活有"高潮"和"低潮"。

[2]to dominate 支配,控制/side effect 副作用/jet lag 时差反应/time zone 时区/shift work 倒班,轮班或调班工作

体内"生物钟"的观点并不令人感到太大的惊奇,因为大多数生物的生命都是按日夜 24 小时的周期运行。这一周期最明显的特征是:在夜晚我们感到疲劳而睡觉;在白天我们清醒而警觉。如果 24 小时的节奏受到了干扰,大多数人就都会有种种不愉快的感觉。例如:国际飞行的旅客在飞越时区时就常有时差感。不适应于倒班工作的人会发现睡眠缺乏会影响工作效率。

[3]coordination 协调,配合,协作/prone 易犯的,偏向的/to be on a short fuse 易发怒,脾气急躁的/nonexistent 不存在的/spell (持续的)时间,服务时间/dry spells 意指艺术家们缺乏创作灵感或热情的"枯竭期"

和睡眠及清醒的日常生活节奏一样,我们也有其他一些生物节奏,其持续时间超过一天,并对我们的生活有广泛的影响。大多数人都持有相同的看法,即在一些日子里我们感觉良好,而在另一些日子里感觉不大好。我们有时候笨手笨脚的,有时候却极为协调灵巧。也有的时候我们似乎极易发生事故或动辄发脾气。也有的时候我们思路敏捷流畅,而有时候脑海里空白一片,这些难道不很奇怪吗?难怪音乐家、画家和作家常常谈论起"枯竭期"。

[4]to identify 鉴定,辨认,验明/resistant 抵抗的,抗……的

科学家们已经验证了如下的三种生物节奏周期:身体生物节奏周期,情感生物节奏周期和智力生物节奏周期。每种周期大约持续 28 天,并分成时间跨度一样的高能期与低能期两个时期。在身体生物节奏的高能期,我们有较强的抗病能力,身体各部分更协调自如,精力更旺盛;在低能期,我们的抗病能力减弱,身体各部分不太协调一致,而且容易感到疲劳。低能期是为下一个高能期"充电"积蓄能量。

[5]critical 危险的,临界的,决定的,关键性的/changeover 转变,转换/vice versa 反过来,反