中国科学技术大学精品教材

English

主编/张曼君

科技英语综合教程

Integrated English Course for Science and Engineering

中国科学技术大学出版社

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内 容 简 介

本教程是为适应大学英语教学改革而编写的，目的是提高理工科学生用英语获取科技信息、拓宽学术视野和开展思想交流的能力。本教程涉及多个领域，如科学素养、科幻文学、太空探索、生物工程、网络技术、交通运输、环境保护和科技社会等，把听、说、读、写、译有机地融合在一起，发展学生的综合英语能力。

本书适合达到四级水平的非英语专业本科生或研究生作为教材或参考书使用。

图书在版编目(CIP)数据

科技英语综合教程/张曼君主编. —合肥：中国科学技术大学出版社，2018.4
中国科学技术大学精品教材
安徽省“十三五”重点图书规划项目
ISBN 978-7-312-04335-2

Ⅰ.科… Ⅱ.张… Ⅲ.科学技术—英语—教材 Ⅳ.G301

中国版本图书馆 CIP 数据核字（2017）第 244626 号

出版 中国科学技术大学出版社
安徽省合肥市金寨路 96 号，230026
http://press.ustc.edu.cn
https://zgkxjsdxcbs.tmall.com
印刷 合肥华苑印刷包装有限公司
发行 中国科学技术大学出版社
经销 全国新华书店
开本 710 mm×1000 mm 1/16
印张 12
字数 242 千
版次 2018 年 4 月第 1 版
印次 2018 年 4 月第 1 次印刷
定价 30.00 元

编审委员会

总　序

2008年，为庆祝中国科学技术大学建校五十周年，反映建校以来的办学理念和特色，集中展示教材建设的成果，学校决定组织编写出版代表中国科学技术大学教学水平的精品教材系列。在各方的共同努力下，共组织选题281种，经过多轮、严格的评审，最后确定50种入选精品教材系列。

五十周年校庆精品教材系列于2008年9月纪念建校五十周年之际陆续出版，共出书50种，在学生、教师、校友以及高校同行中引起了很好的反响，并整体进入国家新闻出版总署的“十一五”国家重点图书出版规划。为继续鼓励教师积极开展教学研究与教学建设，结合自己的教学与科研积累编写高水平的教材，学校决定，将精品教材出版作为常规工作，以《中国科学技术大学精品教材》系列的形式长期出版，并设立专项基金给予支持。国家新闻出版总署也将该精品教材系列继续列入“十二五”国家重点图书出版规划。

1958年学校成立之时，教员大部分来自中国科学院的各个研究所。作为各个研究所的科研人员，他们到学校后保持了教学的同时又作研究的传统。同时，根据“全院办校，所系结合”的原则，科学院各个研究所在科研第一线工作的杰出科学家也参与学校的教学，为本科生授课，将最新的科研成果融入到教学中。虽然现在外界环境和内在条件都发生了很大变化，但学校以教学为主、教学与科研相结合的方针没有变。正因为坚持了科学与技术相结合、理论与实践相结合、教学与科研相结合的方针，并形成了优良的传统，才培养出了一批又一批高质量的人才。

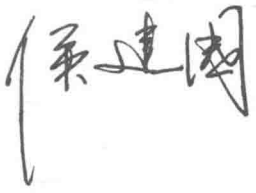
学校非常重视基础课和专业基础课教学的传统，也是她特别成功的原因之一。当今社会，科技发展突飞猛进、科技成果日新月异，没有扎实的基础知识，很难在科学技术研究中作出重大贡献。建校之初，华罗庚、吴有训、严济慈等老一辈科学家、教育家就身体力行，亲自为本科生讲授基础课。他们以渊博的学识、精湛的讲课艺术、高尚的师德，带出一批又一批杰出的年轻教员，培养了一届又一届优秀学生。入选精品教材系列的绝大部分是基础课或专业基础课的教材，其作者大多直接或间接受到过这些老一辈科学家、教育家的教诲和

影响，因此在教材中也贯穿着这些先辈的教育教学理念与科学探索精神。

改革开放之初，学校最先选派青年骨干教师赴西方国家交流、学习，他们在带回先进科学技术的同时，也把西方先进的教育理念、教学方法、教学内容等带回到中国科学技术大学，并以极大的热情进行教学实践，使“科学与技术相结合、理论与实践相结合、教学与科研相结合”的方针得到进一步深化，取得了非常好的效果，培养的学生得到全社会的认可。这些教学改革影响深远，直到今天仍然受到学生的欢迎，并辐射到其他高校。在入选的精品教材中，这种理念与尝试也都有充分的体现。

中国科学技术大学自建校以来就形成的又一传统是根据学生的特点，用创新的精神编写教材。进入我校学习的都是基础扎实、学业优秀、求知欲强、勇于探索和追求的学生，针对他们的具体情况编写教材，才能更加有利于培养他们的创新精神。教师们坚持教学与科研的结合，根据自己的科研体会，借鉴目前国外相关专业有关课程的经验，注意理论与实际应用的结合，基础知识与最新发展的结合，课堂教学与课外实践的结合，精心组织材料、认真编写教材，使学生在掌握扎实的理论基础的同时，了解最新的研究方法，掌握实际应用的技术。

入选的这些精品教材，既是教学一线教师长期教学积累的成果，也是学校教学传统的体现，反映了中国科学技术大学的教学理念、教学特色和教学改革成果。希望该精品教材系列的出版，能对我们继续探索科教紧密结合培养拔尖创新人才，进一步提高教育教学质量有所帮助，为高等教育事业作出我们的贡献。



中国科学院院士
第三世界科学院院士

前　言

随着国际化的不断深入，高等教育改革也面临新的形势。《大学英语教学指南》中提出，“掌握不同语言有利于增进国与国之间的互相了解和理解，英语作为全球目前使用最广泛的国际性语言，是国际交往和科技、文化交流的重要工具”。大学英语的教学目标和方向，也逐步从以前的应试型转变成应用型。大学生学习英语的目的，也逐步转向为他们自己的专业服务。对于高等院校科技专业的学生来说，英语学习是他们进行科技交流必不可少的过程。高等院校毕业生应该打好扎实的语言基础，培养用英语获取科技信息、拓宽学术视野和开展思想交流的能力。本教程正是为了适应这一要求而编写的。

本教程具有以下特点：

1. 强调信息性和实用性

本教程与以培养人文素养为特色的传统大学英语综合教程略有不同，考虑学生在未来的专业学习中对科技内容的需求，强调语言材料的科技信息性和实用性，将科技和人文话题结合起来。

2. 语料题材丰富多样，体裁有代表性

本教程的八个单元分别涉及多个领域，如科学素养、科幻文学、太空探索、生物工程、网络技术、交通运输、环境保护和科技社会等。听说板块既有严肃的科技新闻，也有学术性的演讲和报告，同时也选取了科技人员自行制作的科普视听材料。阅读板块的材料以说明文和议论文为主，有新闻报道、科技评论、总结报告等，既有观点犀利的辩论，也有生动有趣的介绍，每一篇都是科技领域中具有代表性的文章。通过接触这些听力和阅读材料，学生可以了解不同题材和体裁的文章。

3. 培养英语综合能力

本教程的八个单元均覆盖了听、说、读、写、译，具有很强的针对性，着重培养学生需要的英语能力。每个单元由三个部分组成：

第一部分是听力(Listening)。每个单元提供两篇听力材料，学生需完成相应的听力任务，听力板块培养学生听懂科技新闻和讲座的技能，并能根据听力材料开

展严肃话题的讨论。

第二部分是阅读(Reading)。每个单元提供A、B两篇阅读材料。Text A在长度和难度上低于Text B,重点培养学生快速阅读和自学的能力。Text B为700字左右的科技新闻或报告,教师对课文中的背景知识和语言点作讲解,培养学生的精读能力,引导学生熟悉该类文章的词汇、句型、语篇和语体特征,提高获取信息的效率和语言鉴赏能力。

第三部分是练习板块(Exercises)。学生通过词汇练习巩固从Text A和Text B中学到的新词汇。每个单元都提供一个词根词缀的板块,同时还提供一个学术词汇(Academic Vocabulary)的专项练习,引导学生关注学术语体。阅读理解练习让学生回顾从Text B获得的信息。单句翻译练习以语法结构为线索,提高学生汉译英的准确性。写作部分总结学术写作中的常见技巧。

本教程的使用对象为理工专业的本科生,达到大学英语四级水平即可以使用。由于本教程并不是专业英语方向的教程,因此社会科学和人文科学的高年级学生可以作为教材使用,以此保证大学英语教学四年不断线,为以后实际工作和学术研究打下语言基础。

本教程供一学期使用。每个单元总共需要6学时。教师应该合理分配课堂教学和课外自学的时间,建议每个单元在课堂完成4学时,学生课外预习和复习安排2学时。本教程的视听材料在中国科学技术大学出版社网站上可以下载,网址为http://press.ustc.edu.cn。

在本教程出版之际,我们非常感谢中国科学技术大学多位领导和教师的支持。在教材的编写过程中,我们把选取的材料编写成讲义,供中国科学技术大学英语专业一年级学生在"科普英语交流"课堂上使用,学生对此表现出浓厚的兴趣。本教程经历了四年的教学实践考验,具有很强的教学操作性。本教程各单元的编写人员有张曼君、陈静和杨艳霞。龚伟峰对文稿做了校对工作,美国教师Kyle负责部分听力材料的录音,在此表示感谢!

由于本教程涉猎的学科面较广,在编写过程中疏漏之处在所难免,敬请广大师生不吝指正。

编　者

2018年2月7日

于中国科学技术大学

目　录

Unit 1 What makes a scientist?

Science never solves a problem without creating ten more.

By George Bernard Shaw

The important thing is not to stop questioning.

By Albert Einstein

PART ONE Listening

Task 1

Listen to the passage and choose the answer to each question.

Words and Expressions

electric fields		a region around a charged particle or object within which a force would be exerted on other charged particles or objects 电场
quantitative	*a.*	relating to, measuring, or measured by the quantity 数量的;定量的
apprenticeship	*n.*	the job of working for an employer for a fixed period of time in order to learn the particular skills needed in their job 学徒身份
mentor	*n.*	an experienced and trusted adviser 导师
planetary	*a.*	of relating or belonging to a planet or planets 与行星有关的
Georgia Tech		佐治亚理工学院

1. A. He is a scientist.
   B. He is the son of a scientist.
   C. He is the teacher of a scientist.
   D. He is an assistant of a scientist.
2. A. A scientist is usually good at talking.
   B. A scientist is supposed to grasp various skills.
   C. To develop interests is the most important factor.
   D. Doing experiment is what a scientist focuses on.
3. A. Electric field.
   B. Atomic theory.
   C. Chemistry.
   D. Planetary science.
4. A. He is describing what a scientist is doing every day.
   B. He is explaining his scientific research.
   C. He is predicting what the future of science will be like.
   D. He is telling what qualities are required to be a scientist.

Task 2

Watch the video of a brief introduction of an engineer and fill in the blanks with the information you hear.

What is an engineer?

An engineer is someone who wants to know 1) _____ things work. Engineers have to ask themselves three very important questions when they're working.

Case 1: The engineering of the Golden Gate Bridge by civil engineers

No. 1 What is the problem that needs to be solved?

People in San Francisco couldn't travel in and out because the city 2) _____.

No. 2 Who has the problem that needs to be solved?

Residents in San Francisco.

No. 3 Why is this problem important to solve?

People in San Francisco wouldn't be trapped and people out of San Francisco can 3) _____.

Case 2: The engineering of Ford cars by mechanical engineers

No. 1 What is the problem that needs to be solved?

People couldn't 4) _____.

No. 2 Who has the problem that needs to be solved?

Plenty of Americans.

No. 3 Why is this problem important to solve?

Ford Motor Company engineered 5) _____ so that most of Americans can 6) _____.

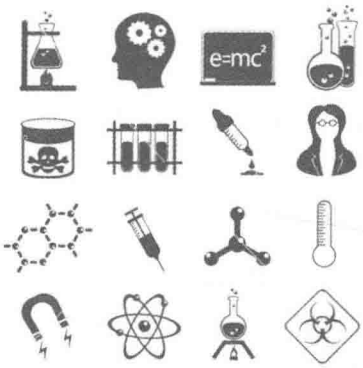
PART TWO Reading

Text A

Attitudes toward Science Education

1. America's position as the world leader in innovation[①] is increasingly being

① innovation *n*. 革新;新事物



challenged by competitor nations that are stepping up their efforts in science and technology — and ensuring that they have an educated workforce up to the task. For too long we have known American students are falling behind in math and science, performing at levels far below students in competitor nations on international tests. Moreover, fewer students are pursuing careers in science, technology, engineering and mathematics (STEM) disciplines at the same time there is a greater demand for the jobs requiring advanced science education or training — from one year post-secondary certificate programs to PhD's.

2. Business leaders, teachers and the science community have long understood the correlation① between improving science education and keeping the United States workforce strong and competitive.
3. But what does the general (voting) public think? How will the United States maintain its position in a global economy? What changes to science education do voters support? A new poll from Achieve reveals voters' overall attitudes about science education and its significance.

Views on Keeping the US Competitive Through Improving Science Education

4. Voters are virtually unanimous② — 97% — in believing that improving the quality of science education is important to the United States' ability to compete globally.
5. A majority of voters give the quality of science education a grade of "C" or below — both nationally (67%) and in their local schools (50%).
6. Most voters (56%), believe science education in the United States ranks behind most other countries. This includes majorities across all major sub-groups, including gender, education, region or political affiliation③.
7. Voters believe a quality science education is critical to our country's ability to

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① correlation *n*. 相互关系;相关,关联
② unanimous *a*. 全体一致的,一致同意的
③ affiliation *n*. (与政党、宗教等的)隶属关系

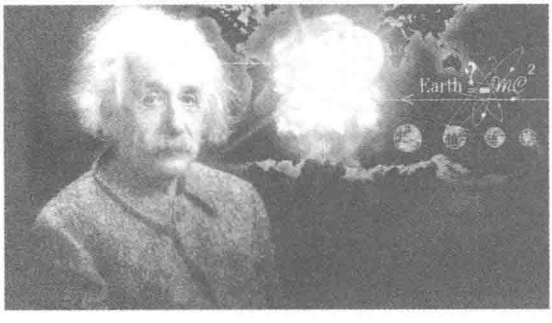
compete globally. They are underwhelmed① by the quality of science education in public schools today, with most viewing it as lagging behind other nations.

Views on Improving Science Education in the Classroom

8. Similar to voters' views on English and mathematics standards, by a margin of almost 2 to 1 (62% to 36%), voters prefer for states to have the same science standards so that students across the country have to meet the same expectations.
9. When informed that a group of states are leading the effort to develop new standards that are internationally-benchmarked②, more challenging, and will require students to apply their science knowledge and understand how science concepts fit together, voters show broad support (87%) for the new standards.
10. The poll findings demonstrate that state leaders and their supporters who have undertaken developing new science standards together do so with solid support from a majority of voters who believe that the United States could strengthen its position in the global economy through improving science education.

Text B

Greatest Mysteries: What Makes a Scientist?



① underwhelmed *a*. 无动于衷的,毫不激动的

② benchmark *n*. 基准 *v*. 以……为标准评估

1. The scientist's job is to figure out how the world works, to "torture" Nature to reveal her secrets, as the 17th century philosopher Francis Bacon described it. But who are these people in the lab coats (or sports jackets, or suits, or T-shirts and jeans) and how do they work?
2. It turns out that there is a good deal of mystery surrounding the mystery-solvers.
3. "One of the greatest mysteries is the question of what it is about human beings — brains, education, culture etc. — that makes them capable of doing science at all," said Colin Allen, a cognitive① scientist at Indiana University.
4. Few scientists have turned the microscope (or brain scanner) back on themselves. So even though the scientific method — with its hypotheses, data collection and statistical analysis — is well documented, the method by which scientists come to conclusions remains largely hidden.
5. "If we could understand scientifically what makes a scientist, this would potentially feed back on science itself and accelerate scientific progress," Allen said.

A Curious Development

6. Two vital ingredients seem to be necessary to make a scientist: the curiosity to seek out mysteries and the creativity to solve them.
7. "Scientists exhibit a heightened level of curiosity," reads a 2007 report on scientific creativity for the European Research Council. "They go further and deeper into basic questions showing a passion for knowledge for its own sake."
8. According to one definition, curiosity is a sensitivity to small discrepancies in an otherwise ordered world. Studies have shown that curious people have a mixture of seemingly conflicting desires: they seek novelty② and strangeness and yet they also want everything in its proper place.
9. The curious scientist believes there is an order to the universe but is always looking for unexpected data points that will test the accepted theory.

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① cognitive *a*. 认知的,认识能力的

② novelty *n*. 新奇,新奇感,新奇性

Creative Tool Kit①

10. To resolve the conflict between data and theory, a scientist often has to think outside the box and approach the problem from different angles.
11. Max Planck, one of the fathers of quantum② physics, once said, the scientist "must have a vivid and intuitive③ imagination, for new ideas are not generated by deduction④, but by an artistically creative imagination."
12. To understand this scientific creativity, some philosophers of science have made an analogy⑤ with child development. The idea is that a scientist uses the same strategies for investigating the world as an infant does discovering his/her surroundings for the first time.
13. "This makes scientific abilities seem like part of a very basic 'tool kit' that is not specific to science itself," Allen said.
14. The astronomer Carl Sagan once said, "Everybody starts out as a scientist. Every child has the scientist's sense of wonder and awe⑥."

Nature and Nurture

15. But others disagree with this universal scientific mind. They believe that scientists have special abilities that set them apart.
16. Discovering these abilities may be hard, Allen thinks, as many scientists will be reluctant to reveal them and would prefer to preserve the mystery of creativity, fearing that if it became an object of study it would lose its magic.
17. But for Allen, this is all part of a bigger question of what lies behind anyone's behavior.
18. "We are only just beginning to understand how the traits⑦ of organisms, including ourselves, aren't the fixed products of either genes or of environment/culture, but each of us is the product of a continual interactive

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① kit *n*. 成套工具
② quantum *n*. 量子
③ intuitive *a*. 凭直觉得到的,直觉的
④ deduction *n*. 演绎,推论,推理
⑤ analogy *n*. 比拟,类比,类推
⑥ awe *n*. 敬畏,惊惧
⑦ trait *n*. 特征,特点,特性