CE

计算机专业英语

学术能力培养

任 伟 编著

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内 容 简 介

本书根据计算机专业英语学术能力的培养要求设计了10个教学单元。每个教学单元分为听、说、读、写、学术能力指导五个模块，深入探讨了如何做研究、如何写论文、如何读论文、如何做学术报告等问题。本书选材新颖独特，均来自名家、名著、名校、名刊，具有代表性和权威性，内容讲解注重启发和引导。

本书适合作为信息类专业本科生、研究生专业英语课程的教材，也适合准备出国攻读硕士、博士学位的学生，准备从事博士后研究的博士生，使用英语进行学术研究的青年教师和自修者，以及在工作中使用英语的IT从业人员和科技英语爱好者。

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Abstract

This book consists of ten elaborately designed training units to foster students' academic capabilities in computer science. Each unit has five components including listening, speaking, reading, writing and inside academics. They extensively discuss some essential problems such as how to do researches, how to write papers, how to read papers, how to give technical talk, etc. This book compiles novel and distinct learning materials; all of them are adapted from well-known masters, prestigious universities, masterpieces and influential journals, thus presenting representatively and authoritatively. The interpretation of such materials emphasizes heuristics and guidance. Besides, numerous exercises are provided in each unit.

This book is suitable for performing as a textbook for under graduate students and postgradute students majored in information science. It is also appropriate to students who prepare to go abroad to attain master degree or doctor degree, postdoctoral researcher candidates, junior faculties who rely English in their academic researches, IT professionals who involve English in their daily routine and enthusiasts who are interested in technical English.

前　言

多数计算机专业英语的教材过于侧重阅读能力的培养，随着部分专业课程双语教学的开展，计算机专业英语教材以及计算机专业英语课程应该在两个方面做出相应调整：计算机专业英语教材不应仅仅培养学生阅读计算机英文文献的能力，而应该全面提高其听、说、读、写、译等综合能力；特别重要的是，目前的计算机科学教学体系中尚没有针对学生学术能力培养的专门训练，这些学术能力包括如何做研究，如何阅读论文，如何撰写论文，如何做技术性学术报告等，以至于培养的学生无法用英语进行学术交流。

目前专门针对学术研究能力训练和学术素养培养方面的教材还不多见，据编者所知，本书是国内第一本涵盖学术能力培养和专业英语听、说、读、写、译技能培养的计算机专业英语高等学校教材，比较全面地参考了在学术能力培养方面美国的计算机科学高等教育是如何做的，包括学术建议、经验教训、重要提示、启蒙指导、启发式方法等。

作为国际交流的主要语言，英语在学术研究和IT产业竞争中的地位日益重要。在我国建设国际高水平大学的过程中，国际学术交流成为重要组成部分，这对在校的本科生、研究生和青年教师提出了更高的要求。在全球化经济发展趋势下，大量国际IT企业进入我国，本土企业也积极参与国际竞争和寻求国际化发展。因此，在培养具有国际视野和国际竞争力的“新世纪”大学生、研究生的过程中，需要告诉他们：国际一流大学的学生是如何做研究、如何进行学术能力培养的，什么是国际学术交流的惯例，需要提高他们使用英语进行技术创新，及对外技术推广和产品宣传的能力。

计算机科学与技术专业是全国高等学校办学最多的专业，同时“计算机专业英语”又是计算机科学与技术专业中一门重要的专业课。针对部分高校在双语教学方面逐步使用英文原版教材进行教学的现状，“计算机专业英语”课程的目标应从单纯用英语讲解专业内容转变成为全面提高运用英语从事计算机专业相关工作的能力（如听、说、读、写、译等），所以专业英语教材建设是一个填补重要的高等教育遗漏点的黄金机会，通过该门课程的学习来提高学生运用英语进行学术研究的能力，以及在高科技研发型企业从事技术交流的能力。

本书在写作的过程中遵循了以下思路。

（1）精心选择英语原版素材，注重内容的代表性和针对性。例如：听力内容的类型包括课堂教学（Lecture）、国际学术会议的报告（Tutorial Presentation）、计算机行业展览的主题演讲（Keynote Speech）、产品发布会等；口语的类型包括个人演示（Presentation）、技术演讲（Talk）、研究生（博士）论文答辩（Ph.D. Defense）、面试谈话（Interview）等；阅读的文章类型包括课本、通俗科技短文、专业杂志短文、学术会议论文、学术杂志论文等；写作的类型包括英语写作的思维习惯，简洁学术论文英语写作方法，科技论文的组成部分，计算机科学技术论文的写作方法，标题、摘要和结论的写法等；学术指导包括如何做研究，如何做研究生，如何写Email（Email礼节），如何写简历（CV、Cover Letter）、

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学术论文（Research Paper）、毕业论文（Dissertation/Thesis）、个人陈述（Personal Statement）、文献综述、项目申请书（Research Proposal）等。

（2）注重内容的权威性和经典性。大会演讲来自 Microsoft 主席比尔·盖茨（Bill Gates），产品发布来自 Apple 公司主席乔布斯（Jobs），讲课听力来自 Harvard 和 MIT 的真实课堂视频，学术会议讲解来自于 UIUC 的著名学者 ACM 会士 Jiawei Han（ACM SIGKDD 的官方网站）。阅读内容中科技短文选自 *Nature*、*Science*、*Scientific American* 等著名杂志，学术论文来自 IEEE 专业杂志和高影响因子的学术期刊，如 IEEE TIT，以及 *Citeceer* 引用数最多的杂志文章。课文来自计算机领域引用率最高的教科书。写作指导的内容摘录自 William Strunk 的名著 *Elements of Style*，以及 Claire Kehrwald Cook 的 *The MLA's Line by Line How to Edit Your Own Writing*。关于学术能力培养的文章主要来自于美国著名大学（如 UC Berkeley，Columbia，MIT，Harvard，Stanford），以及著名学者（如图灵奖获得者 E.W. Dijkstra，R. Hamming,，D. Knuth 等）。

（3）精心组织和安排内容，由浅入深，教学单元相对独立，可灵活组合。书中提供了学术研究和学术生涯设计的背景知识讲解和评述，便于读者了解学术生涯的主要工作组成和学术英语能力培养的主要努力方向。

全书共分 10 个单元，每个单元都安排了听、说、读、写、学术能力指导 5 个子单元。书中根据教学内容精心设计了课堂练习和课后习题，便于自学和课堂教学。为加深读者对内容的理解，本书还提供了一些补充参考资料，如继续阅读的书籍、论文以及网络资源。每个单元的教学参考时间约为 4 个学时，全书约在 40 个学时完成。本书用到的全部听力、视频电子资源以及部分中文译文可从本书配套网站（清华大学出版社网站）下载。

本书面向的主要读者对象包括信息类专业本科生、研究生，准备出国攻读硕士、博士学位的学生，准备从事博士后研究的博士生，使用英语进行学术研究的青年教师，以及在工作中使用英语的 IT 从业人员和科技英语爱好者。

成书之中，外国语学院张红燕教授审阅了部分内容，牟扬老师和研究生刘宇靓协助翻译了部分内容，Dr. Lan Yi 给出很多建议，在此表示感谢。由于作者水平有限，不足之处在所难免，在此衷心希望读者提出意见和建议。我的邮件地址是：weirencs@cug.edu.cn。

任　伟

2011 年 1 月于武汉南望山

Preface

Currently available textbooks for subject English in computer science place excessive emphasis on training reading skills. However, with the growth of some core courses being taught in English or Bi-languages, it is mandatory to adjust syllabus and textbook on subject English accordingly in two aspects: First, the textbook should perform not only for training reading abilities on computer literature, but also for improving comprehensive skills such as listening, speaking, reading, writing and translating, etc. Second, or in particular by mistake, current curriculum in computer science lacks courses for training academic skills such as how to do researches, how to read papers, how to write papers, how to do technical presentation or talk, etc. As a result, graduated students are not prepared for fluent communication in English among international academic communities.

It is rarely found a textbook in current market that concentrates on the training of academic research abilities and academic methodology. So far as we know, this book is the first textbook that intends to foster not only academic capabilities, but also comprehensive skills such as listening, speaking, reading, writing, and translating in subject English. It does extensively refer to a large number of approaches and methods in higher education of USA, consisting of academic suggestions, experiences and lessons, insightful comments, enlightening remarks and heuristics, etc.

English is actting a more and more important role in international academic communications and industrial competitions related to Information Technology (IT). During the courses of developing of high-level universities in China, international academic exchanges present a key component for world-wide recognition. This drives undergraduate students, graduate students and junior faculties to attain a higher expectation. Moreover, due to globalization, numerous international IT companies enter the Chinese market; domestic companies also compete in international markets and expand globally. Therefore, it is obligatory to educate so-called "new-century" undergraduate and postgraduate students who can be equipped with international vision and survive in international competition. We need to educate them to grasp how researches are conducted in world top universities, how students in these universities are trained, what are the conventions in international communications. We also need to let them understand how to exploit English to conduct technical innovation, technology promotion and product propaganda.

Computer science and technology is one of the most popular majors in higher education. Additionally, subject English in computer science is also a prominent course in curriculum. As some universities start to select original English textbooks, the syllabus of subject English course should migrate from only explaining computer science knowledge to improving

students' comprehensive capabilities in professional career (such as listening, speaking, reading, writing and translating). In particular, it is a golden opportunity to fill the gap in higher education, namely, to help students build promising academic characteristics or working styles, and to help them expand their abilities for technical communications in high-tech companies.

This book adopts some novel ideas as follows:

(1) We elaborately select original English materials, and we stress that the contents should be representative and pertinent. For example, the listening materials include lecture in class, tutorial presentation in international conference, keynote speech in computer exhibition and product launches, etc. The speaking materials include presentation, technical talk, Ph.D defense or master thesis defense, interview, etc. The reading materials include textbook, popular technical articles, professional technical articles, academic conference papers, journal papers, etc. The writing materials include the difference of thinking mode between native writer and non-native writer, the methods of plain and concise English writing, the ingredient of scientific writing, the computer science writing skills, and how to entitle, compose abstract and conclusion, etc. Inside academic sections present how to conduct effective researches, how to survive in graduate school, how to compose emails properly (email etiquette), how to prepare CV, cover letter, research papers, dissertations, personal statements, literature reviews, and research proposals.

(2) The adopted materials are authoritative and classical. For example, keynote speech given by Bill Gates, product launch released by S. Jobs, lectures captured from real record in Harvard and MIT's classroom, conference presentation given by Jiawei Han, professor in UIUC and ACM fellow. The reading materials are adapted from famous journals such as Nature, Science, and Scientific American, and so on. Academic papers are from IEEE magazine or journal with high impact factor, e.g., IEEE Trans. IT, and the most cited papers listed in Citeceer. Textbook reading material is selected from the most cited textbooks in computer science. Writing guidance is adapted from William Strunk's Element of Style, and Claire Kehrwald Cook's The MLA's Line by Line How to Edit Your Own Writing. The suggestions, comments, guidances and experiences are proposed by university research support center of top universities in USA, such as UC Berkeley, Columbia, MIT, Harvard, Stanford, and so on. Some of suggestions are even provided by Turing awardees, such as E.W. Dijkstra, R. Hamming, and D. Knuth.

(3) All materials are carefully organized and arranged for teaching and studying purpose, progressing gradually and smoothly. The units are independent and can be rearranged on demand. The remarks on background of academic researches and research career design are commented in each unit. They will facilitate readers to understand the components in scientific career and make endeavor objectives more specific in academic English training.

This book consists of 10 units, and each unit consists of 5 subunits—listening, speaking, reading, writing and inside academics. The in-class quizzes and after-class exercises are both

elaborately designed for teaching and self-study. To further strengthen readers' understanding, the book provides additional references, including reference books, papers and Internet resources. Each unit can be taught or learned in 4 hours, so total will cost 40 hours. All the audio and video resources used in this book can be downloaded from affiliated Web site in Tsinghua University Press.

This book serves undergraduate students or postgraduate students who major in information sciences, students who plan to go abroad to pursue master degree or Ph.D, domestic Ph.D candidates who prepare for applying oversea postdoctoral research, junior faculties who rely on English for academic researches, IT professionals who involve English in their daily routine and enthusiasts who are interested in technical English.

In the compilation of this book, Prof. Hongyan Zhang in school of foreign language, CUG reviewed parts of the book. Yang Mu, and my graduate student Yuliang Liu helped me translate some articles. I sincerely appreciate their efforts. Thanks also go to Dr. Lan Yi for her insightful comments. As the limitation of author's knowledge, some weakness might not be evitable in this book. Hereby, we are looking forward to receiving your feedback and suggestions. My email is weirencs@cug.edu.cn.

The work in this book is supported by "the Fundamental Research Funds for the Central Universities".

Wei Ren, Ph.D, Associate Professor
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Jan., 2011
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Unit 1

Outline:

- Listening: 1) A technical team puts microscope on cellphone. It is a 60-second report selected from Scientific American.
- Listening: 2) Diverse personal networks influences local economy. It is also selected from Scientific American.
- Speaking: How to make your speaking easier and more effective.
- Reading: "What is computer science" and "history of computer science" from Wikipedia.
- Writing: Introduction to writing in English for an English academic audience from non-native speakers.
- Inside Academics: How to write email or what is email etiquette.

Objectives:

- Listen and be able to understand general topics in computer science and technology.
- Learn some overall ideas for easy and effective speech.
- Obtain a global overview on computer science, including its subtopics and history. Words are selected from Wikipedia, which is a recommended starting point for tutorial information on computer science.
- Keep in mind an alert on thinking mode in the writing. That is, write in English culture manners for English audience. This guidance analyzes organization patterns between different cultures or languages, provides a visual shock and brainstorm. The materials aim to help non-native speakers to write for academic audience.
- Learn to write polite Email and attain good Email writing style.

1.1 Listening: Tech Team Puts Microscope on Cell Phone

1. Choose the Proper Words or Expressions

Listen to a short passage. Pick out the underlined words or expressions which are the closest to what you have heard.

After hundreds of years, the most common, basic microscopes still operate by means of the same old hardware: the lens. But what if you could do away with that lens and create a microscope that fits on a cell phone? That's what researchers led by Aydogan Ozcan at U.C.L.A. have developed. Ozcan recently ①run; ②won an NSF (National Science Foundation) Early Career Development award for his work.

Normal microscopes image cells themselves. But Ozcan's team is imaging their shadows. Tissue cells and bacteria are semi-transparent—light penetrating ①through; ②blue cells causes shadings and reveals texture. Ozcan uses an LED as his light source, creating cellular shadows. An algorithm turns those shadows into an image of the cells.

Millions of people in the developing world suffer because they're misdiagnosed, or because simple ①diseases; ②disaster are missed. With this system, a blood sample can be loaded into a small imaging device attached to a cell phone. The cellular image generated from the sample can be transmitted to a central computer in a nearby ①hostel; ②hospital. The image can be assessed for disease, with the resulting diagnosis sent back to the field in just minutes. Tests of the device begin in Africa this summer.

(Cynthia Graber, Tech Team Puts Microscope on Cell Phone, Scientific American 60-Second Science, June 2, 2010)

Vocabulary

Microscope	['maikrəskəup]	n.	显微镜
UCLA	University of California Los Angeles		加州大学洛杉矶分校
tissue	['tiʃju:]	n.	组织
bacteria	[bæk'tiəriə]	n.	细菌
semi-transparent		adj.	半透明的
texture	['tekstʃə]	n.	质地，纹理
assess	[ə'ses]	v.	评估

2. Answer the Questions

Listen to the passage again. Try your best to understand the lines and answer the following questions without looking at the transcript.

1) What part of cells is imaged by Ozcan's team?

_____

2) What can be loaded into a small image device attached to a cell phone?

_____

3) Why can such system help the people in the developing world?

_____

3. Dictation

Listen to another short passage and fill in the blanks with the words you have heard.

Social networking is all the rage. Seems the more people we know, the better we feel. But that drive for being connected may enrich more than our social lives. Because a study in the journal Science shows that the more ___①___ our personal networks, the stronger the local economy.

The fact that having broad social ties can financially benefit an individual makes sense. The more people you know, the more job opportunities you might be made ___②___ of. After all, that's what networking is all about.

But just how far do the benefits of these far-reaching associations really reach? Using reams of phone records, both landline and cell, scientists mapped out social networks across the entire United Kingdom. And they compared those maps with detailed information on regional economic conditions.

The results showed that ___③___ in which residents have more extensive connections are indeed more prosperous. Presumably because economic opportunities are more likely to come from contacts outside a tightly knit local group of friends. So keep building those social networks. It's not a total waste of time. It just might be your own personal economic stimulus package.

(Karen Hopkin, Diverse Personal Networks Linked to Strong Local Economy, May 24, 2010)

Remarks: The Scientific American 60-second podcast is an outstanding source for popular science and technology for broader audiences. Accessing it instantly will assist you in grabing latest updating of comtempory science and technology.

Vocabulary

rage	[reidʒ]	n.	愤怒，情绪激动
enrich	[in'ritʃ]	v.	使充实
diverse	[dai'və:s]	adj.	不同的，多种多样的
ream	[ri:m]	n.	大量
prosperous	['prɔspərəs]	adj.	繁荣的
presumably	[pri'zju:-məbli]	adv.	大概，推测起来
stimulus	['stimjuləs]	n.	刺激；激励

Answer:

1. ②①①②
3. ①diverse; ②aware; ③communities

1.2 Speaking: How to Make Your Speaking Easier and More Effective

1. Follow the Guidance

Please read the guidance below and learn how to make your speaking easier and more effective.

1. Audience Analysis Remember that the members of the audience are supposed to be the beneficiaries of your communication.	受益人
1) Don't make too many assumptions about your audience. But you do have to make some. 2) Figure out the basics. Who are these people?	
• demographics (age, ethnicity, gender mix, etc). • predispositions (hopes, fears, positives/negatives, level of interest). • knowledge of/experience with subject/me.	人口统计；种族 素质与倾向
In what kind of setting will they receive this information? • large lecture hall or small seminar room or classroom. • lighting and sound issues. • time of day.	

3) Take into account the "me, here, now."	
• Picture yourself as a member of the audience and ask "How does this message affect me, here, now?"	
• Me, here, now translates into what you as a sender have to offer your students/receivers—what they will be able to understand, accept, support, consider important—because it matters to them.	
4) Establish cognitive/behavioral objectives for your audience:	认知的
• What do I want my students to know?	
• What do I want my students to do?	
2. Openings and Closings	
1) Openings. Stay away from the predictable (Good morning. On Monday, we talked about..., Today, I'd like to move onto...). Instead:	
• Begin with a provocative question, anecdote, or current event—and how it relates to the content.	煽动性的
• Ask the audience a question.	
• Set up a problem—and promise that they'll have all the tools for a solution by the end of the class.	
2) Closings. Many speakers simply talk until the end of the time or beyond it—and say "I See We're Out Of time." Instead:	
• Plan a rhythm for your speaking-plan to end with content 5 minutes early, so you can summarize and raise questions.	节奏
• Set aside a time for questions—and structure that time.	
3. Preparation	
You probably can't cover everything you want to in a lecture.	
1) Decide what is essential, what is important, and what is helpful (what would be nice).	
• Cover the first; try to cover the second; forget about the third.	
• Release a little control over the material and rely on the textbook or a list of supplementary readings for the nonessentials.	补充的
2) Set objectives.	
• What do you want to have accomplished at the end of	

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