ENGLISH FOR COMPUTER TECHNOLOGY AND APPLICATION

计算机技术及应用英语

蒋学锋　杨明华　编
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前 言

在不久的将来，我国科技工作者和工程师在进行科学研究时，很多地方必须应用科技英语和信息检索技术，才能通过计算机终端从与世界各地相连的计算机网络中获得领域有关的重要信息。也就是说，科技英语、基本的计算机知识和信息检索技术不仅紧密相关，而且也将有机地结合成一种通用的工具。这一工具对于我国科技工作者和工程师胜任将来的工作是必不可少的。

在我国，随着信息时代的到来，经济体制和政治体制改革的深入，国家教委已经强调理工科大学生应当接受应用计算机基础知识和科技英语知识的基本训练。理工科大学生学习英语的主要目的是扩展他们自己查找和利用信息的能力。大学英语教学必须紧跟世界科学技术的新发展，以使培养的学生将来能够高效率地工作，完全胜任激烈的竞争，并为我国乃至世界的发展作出贡献。为此，国家教委已要求各个大学开设英语专业阅读课，以使大学生在一、二年级学完公共英语课程以后，能继续进行英语学习，使英语教学不断线。

根据国家教委的这些要求，我们尝试性地编写了两本书，名为“情报检索(英语)”和“计算机技术和应用(英语)”，以便满足教学的需要。这两本书在科技英语阅读技能教学方面互为补充。它们包括了国家教委规定的各项阅读技能。第一册“情报检索(英语)”讲解了参阅技能、总体浏览和定题查找等；第二册“计算机技术和

应用(英语)"讲解了图表理解、摘要撰写和翻译要点等。然而,每本书也相对独立,可以根据需要选用一本。第一册的重点是介绍如何以英语作为信息检索手段。该书不仅能使学生懂得信息检索的基本概念,也能使学生了解科技英语的特点,为掌握和运用信息检索技能奠定基础。第二册介绍计算机软硬件的基本概念、主要部件的原理、计算机技术的发展史和新成就,并对世界上各种最新应用作了简介。该书的内容覆盖了当代大学生和科技工作者应当掌握的计算机的基本知识和操作技能,遵循理工科"计算机导论"课程教学大纲的要求。

两本书的主要特点是它们对理工科大学各个学科领域的广泛适用性,能满足专业英语阅读课程的教学要求。两册书把科学知识学习和专门的语言技能训练结合起来同步进行;选材真实,覆盖范围广;真实材料的合理选择和精心组织使只有中等英语水平的大学生和工程技术人员能较容易地理解和掌握。大量的各具特色的阅读材料和情景教学任务,也展示了英语词汇的多种用法,可进一步提高读者理解真实的科技英语文章和检索主要信息的能力。我们真诚希望两本书在以英语为媒介获取科学知识和技能的训练中发挥作用。

两本书的另一个特点是为60%以上的练习提供了参考答案(附在书末)。这使两本书也可以用来自学。另外,无论是经过正规教学还是自学,读者不难发现书中不少资料可以留作工作时参考。

对于专业阅读课来说,材料的选择是极其重要的。Hutchinson and Waters 在1992年提出的六条选材原则,指导我们完成了这两本书的编写。它们是:

1.材料可激发学习兴趣。好的材料不必教,它本身就能鼓励

学习者不断学习；

2. 好的材料应提供清晰的条理结构，能指导教师和学生通过各种活动增加学习机会；

3. 材料能完整地具体地体现语言的特色和学习过程的特点；

4. 材料能反应学习任务的性质，并努力使学习任务的复杂性和可管理性取得平衡；

5. 材料通过给教师介绍新技术，能对拓展教师的知识起到积极作用；

6. 材料能提供正确的合适的语言运用的模型。

根据上述原则，用于这两本书的素材全部选自英文书籍、报刊和杂志，并依照知识内容本身的体系结构和我们的教学经验进行系统的组织和编排。因此，本教材可望达到 Nuttall 所说的“能使学生在没有任何帮助的情况下阅读不熟悉的真实资料”。

“计算机技术和应用(英语)”这本书由七个单元组成，分别讨论各种英语阅读技能和计算机技术。正如 David 在 1986 年指出的，阅读技能包括四个方面：

1. 认识词汇的含义；

2. 获取推理的结论；

3. 识别作者使用的技巧和每段的语气；

4. 寻找问题的答案。

本书正是从这四个方面组织材料培养阅读技能的。在讲述计算机技术时，本书的课文，采取从一般到特殊、从简单到复杂，逐步深入的方式进行组织，系统地介绍了计算机科学领域的基本概念和基本原理，以及计算机的基本知识和技术。本书的七个单元是：

第一单元　计算机系统简介　　本单元介绍计算机更新换代的历史、基本部件和功能、系统结构、软硬件之间的关系、计算机系

统的分类及其应用;在语言学习方面,介绍了作科学预言时使用的各种英语句型。

第二单元 计算机软硬件基础 本单元介绍各种数字系统及其运算、几种常用的信息表示(编码)标准、布尔代数、电子线路和逻辑器件(如触发器和寄存器)、数据结构(如堆栈和队列)、算法和复杂性度量方法。在语言学习方面,对如何描述因果关系的句型作了初步讲解。

第三单元 计算机语言和程序设计 本单元介绍编程语言的历史、程序设计的概念和过程、程序设计的方法(学习使用简化的 Pascal 语言)和高级语言的新发展(如第四、五代计算机语言);并对因果关系的描述方法作了更深入细致的讨论。

第四单元 系统软件及其功能 本单元讲述操作系统的基本概念和常见类型、DOS 和 Windows(如 DOS 的主要命令集和 Windows 95 的安装步骤)的详细特色。对用户接口、操作环境和专用工具(如 PCTOOLS 和 QAPLUS) 也作了介绍。语言学习方面着重介绍各种类型的文摘(如指示性文摘和报导性文摘)及其写法。

第五单元 计算机工程简介 本单元着重讲述怎样选购计算机系统,怎样开发基于计算机的应用系统。计算机工程的概念(含软件工程)和辅助应用软件开发的各种工具等也作了介绍。图表理解是专业外语教学的重要组成部分,本单元对各种图表(如线性图、园饼图、流程图、体系结构图和组织机构图)也作了详细讲解。

第六单元 分布式计算机系统和办公室自动化 本单元介绍分布式系统、计算机网络(如局域网和广域网)、数据库系统的类型和分布式数据库、办公室工作的特点和办公室自动化的进展。

在语言学习方面着重讲解翻译标准及英语科技文章翻译时应该注意的问题。

第七单元 高级计算机技术 本单元讨论当代计算机领域的各种高级技术，如多媒体个人计算机、人工智能、专家系统、虚拟现实、面向对象的编程技术、机器人和自动化。两册书中反复强调的阅读技能，在本单元的练习中继续进行训练，以便巩固。

上述语言技能学习已合理地分成了多个 Language Focus，系统地安排到各个单元。读者可从中得到帮助，以便解决阅读英语科技文章时常遇到的困难。

本书标有"*"号的 Lesson 和 Task 是特意为计算机专业的学生选择的。它们中的大部分应安排在为这类学生制定的教学计划中；其他专业的学生可在教师指导下选读一部分，不作教学要求。书中其它材料，应全部列入非计算机专业学生的教学计划；对计算机专业的学生，我们建议第二单元到第四单元的大部分内容作为课外阅读，而其它部分也应列入教学计划，但进度可以稍微快一些。

专业英语阅读是一门必修课，在大学教学第五个学期到第七个学期开设，每周至少二学时，由相关专业的教师主讲。这两本书分别在第五、第六学期使用。学习本课程的学生应该已学完两年公共英语，并至少已经通过大学英语三级考试。这两个条件对于在校学习的大学生来说，是完全必要的。也可以这样理解，开始学习本课程的学生至少应该具有这样的英语水平：对一般的阅读材料（如中国日报（英）），每分钟阅读 45 个词而理解的正确率达到 70％以上。如没有这样的英语基础，就会有不少困难，可能跟不上教学进度；或者可能使教学计划无法在两个学期中完成。

在编写这两本教材的三年里，我们得到了重庆大学外国语学

院韩其顺教授的热忱鼓励、指导和多方面的大力帮助，借此机会表示衷心感谢。我们还要感谢贵州大学计算机科学系 91、92、93、94 和 95 级学生对教材的组织和教学方法的改进所提出的宝贵建议。另外，贵州大学图书馆的年青教师蒋磊和计算机科学系的学生汪琳、陈琦、彭箐、潘自强、龙慧云和冷春霞在材料整理和计算机输入、校对等方面做了大量的细致的工作，在此深表感谢。

作 者

一九九七年八月于贵阳花溪

PREFACE

In the coming years, Chinese scientists and engineers will have to use science English and computer terminals to do much of their research work and be able to obtain pertinent information in their particular fields of research, through a variety of information retrieval skills from computer network systems linked throughout the world. In other words science English, basic computer knowledge, and information retrieval skills are not only closely related to each other but will also become a universal integral tool, which is indispensable for Chinese scientists and engineers to be competent in their future work.

In China with the coming of the information age and the development of both economical and political reform, the CSEC (Chinese State Education Commission) has been increasingly emphasizing that the university students majoring in science and technology should receive basic training in both fundamental computer knowledge and science English. A primary aim of English learning for these students, therefore, is to develop their abilities in both retrieving and using information. Universities must also keep abreast of latest science and technology developments around the world so that they can

assist their students to become more fully prepared for both their future competitive working careers, and as valuable citizens contributing more efficiently and effectively to their country's, and by extension the world's, development. The CSEC has asked all universities to develop courses in specialized reading so that students can continue their training in English after they complete the general English courses offered in their first and second year at university.

In attempting to meet these needs the present writers have tentatively written two books, namely *English for Information Retrieval* and *English for Computer Technology and Application* which follow the guidelines set by the CSEC. These two books complement each other in the training of science English study skills. They include the reading skills stipulated by the CSEC. Book one "English for Information Retrieval" covers: reference skills, surveying, locating information, etc.; book two "English for Computer Technique and Applications" covers: understanding graphic presentation, abstract writing, and translation principles etc. Each book can, however, be studied independently of the other according to a reader's special needs. The first book lays emphasis on the use of English as a means of information retrieval. It helps students develop the ability to understand and handle not only basic information retrieval concepts, but also specific English language features, which are common to and important in all manner of science and technology information retrieval skills. The second book introduces the basic concepts, main components (including both hardware and software), the history of and latest developments in computer technology, and also gives a general review of a wide variety of its applications in current times around the world. The basic computer knowl-

edge covered in this book is what is necessary for university students and today's engineers to gain an essential knowledge of and some practical skills in computer science. This book follows the "Introduction to Computer Science" syllabus, for education in science and technology.

A main feature of both books is their suitability, over all academic fields, for the "Special Reading Course" offered by universities of science and technology. This is because: the study of science knowledge has been simultaneously combined with the training of specific language skills; the authentic materials selected cover a wide range of relevant materials; and finally because these authentic materials were chosen so that they can be easily understood by students and engineers with only an intermediate English level. The wide variety of reading materials and situations tasks, also illustrate how English words are used in a variety of ways, and furthermore develop the students' ability to read authentic English articles and at the same time retrieve information. It is the present writers sincere hope that these two books can be successfully used in training readers to acquire greater knowledge and skills in science and technology through the medium of the English language.

Another feature of theses two books is that the answers to more than 60% of the tasks are provided for reference at the end of each book, so that other interested readers may even make use of the book as material for individual self – study. Indeed students who complete their course of study, whether formally or informally, will enjoy keeping these books at home or in their future places of work or research as an valuable reference volumes for years to come.

The reading materials are the most important element in the

specialized reading course. There are six principle (Hutchinson and Waters, 1992) which guided us in the actual writing of these books.

1. Materials provide a stimulus to learning. Good materials do not teach: they encourage learners to learn.

2. Good materials should provide a clear and coherent unit structure which will guide teacher and learner through various activities in such a way as to maximize the chances of learning.

3. Materials embody a view of the nature of language and learning.

4. Materials reflect the nature of the learning task and should try to create a balanced outlook which both reflects the complexity of the task, yet makes it appear manageable.

5. Materials can have a very useful function in broadening the basis of teacher training, by introducing teachers to new techniques.

6. Materials provide models of correct and appropriate language use.

All materials used in these two books are carefully chosen from English books, Journals or newspapers according to the six principles mentioned above, and are arranged systematically according to the content of knowledge itself and our own teaching experience. So they can be used to "enable students to read without help unfamiliar authentic understanding" (Nuttall, 1982).

This book, *English for Computer Technology and Application*, consists of seven units which deal with different levels of English reading skills and Computer Technologies. As David (1986) points out reading skills include four aspects:

1. identifying word meanings,

2. drawing inferences,

3. identifying the writer's technique and recognizing the mood of a passage,

4. finding answers to questions.

For reading shills, the materials are organized following these aspects. And for the knowledge of computer science, the texts in the seven units are arranged from basic and simple concepts and principles to specific and complex ones. The seven units are as follows.

Unit One *Brief Introduction to Computer Systems* This unit introduces computer generations, basic components and their functions, architectures of computer systems, the relationship between software and hardware, and the classification of computer systems and their applications; and provides a variety of sentence patterns on how to make scientific predictions.

Unit Two *Basis of Computer Hardware and Software* This unit introduces numbering systems and their arithmetic operations, the standards of information representation, Boolean algebra, electronic circuits and logical devices (e.g., flip－flops and registers), data structures (e.g., stacks and queues), algorithms, and complexity measures. In language focus, the sentence patterns on how to describe the relationship between causes and effects are introduced.

Unit Three *Languages and Program design* This unit introduces the history of programming languages, the concepts and procedures of programming, program design methods using a simplified PASCAL language, and the new development of high－level languages (e.g., fourth and fifth computer languages). Causes and effects are discussed further in detail.

Unit Four *System Software and Its Functions* This unit gives the concepts and types of operating systems, the detailed features

about DOS and Windows (e. g., the main command sets of DOS and the installation steps of Windows 95). The user interface, operating environments, and special tools (e. g., PCTOOLS and QAPLUS) are also introduced. The language study skills about the types of abstracts, such as indicative abstract and informative abstract are discussed.

Unit Five *Introduction to Computer Engineering* This unit focuses on the topic of how to buy a computer system and how to develop a computer – based applications system. The concepts of computer engineering (include software engineering), and the tools and techniques for assisting the development of applications software are also introduced. A variety of graphs (e. g., line graphs, bar graphs, pie graphs, flowcharts, schematic diagrams, and organizational charts) are explained.

Unit Six *Distributed Computer Systems and Office Automation* This unit introduces the distributed systems, computer networks (e. g., LAN and WAN), types of database and distributed databases, the features of office work and the current states of office automation. In language focus, some essential principles about translation are explored.

Unit Seven *Advanced Computer Technologies* This unit focuses the discussion on the variety of topics about advanced technologies in today's computer world, such as multimedia PC, artificial intelligence, expert system, virtual reality, object – oriented programming, robot, and automation. Training on some important language skills are included in the tasks of this unit as well as the two books for consolidation.

The language study skills mentioned above are arranged in sev-

eral Language Focuses which appear in each unit so as to help readers cope with general language problems in reading science articles in English.

In this book, the lessons or tasks marked ' * ' are specially selected for the students majoring in computer science. Most of them should be arranged in teaching plan for these students; other students might select some of them in spare time as an extensive reading under the supervision of teachers. All the other materials in this book should be arranged in teaching plan for the students who do not major in computer science; but for the students majoring in computer science, more than half of them (e.g., from *UNIT TWO to UNIT FOUR*) can be left out from the plan, or arranged as homework for fast reading.

The specialized reading course is intended to be a compulsory course and will be offered from the 5th semester on through the 7th, at least two hours a week, by the relevant subject teachers. These two books can be used in the 5th and 6th semesters respectively. Students attending this course must have learned general English for two years and have passed College English Test – Band Three or higher. These two pre – requisites are essential for university students learning in universities or colleges. That is to say, for the general reading materials such as China Daily, the students or the readers before embarking on this course should be able to read general English materials at a speed of no less then 45 words per minute with at least 70% accuracy in comprehension. Without this basis they might have difficulties in keeping up or completing the required tasks, and it may be impossible for them learn the two books well within the two semesters.

We are grateful to Professor Han Qishun at the Foreign Languages College of Chongqing University for his great encouragement and valuable advice in the procedure of writing these books. Also we appreciate students of grades 91, 92, 93, 94, and 95 in the Computer Science Department of Guizhou University for their precious suggestions about the organization of the materials and the improvement of the teaching methods. Special thanks to Jiang Lei a young teacher in the library of Guizhou University and the students Wang Ling, Chen Qi, Peng Qing, Pan Ziqiang, Rong Huiyun, and Ren Chunxia in the Computer Science Department for their careful work in making the manuscripts of the books readable on computers. To all, our thanks.

Editors

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