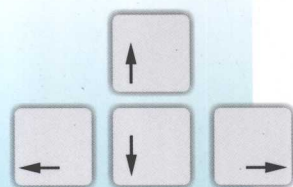


# CONCISE COMPUTER BASICS

## Practical & Integrated

### 简明计算机英语综合教程

■ 主 编 王焕科  
■ 副主编 陈雪峰 朱 俏 黄 琼



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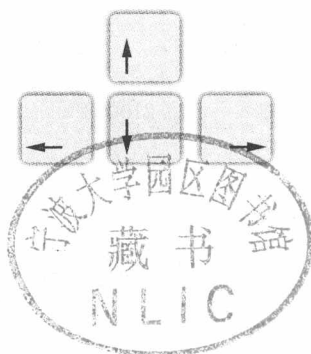
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## 序

《简明计算机英语综合教程》(Concise Computer Basics Practical & Integrated) 是主编王焕科作为主持人的 2011 年江苏省教育厅课题《以就业为导向的高职高专计算机英语课程与教学内容体系改革研究与实践》的研究成果之一。在此课题获得通过之前,该教材的初稿已经在苏州高博软件学院的软件工程系和网络工程系使用了 2 年。若从规划算起,相关的研究工作实际上在 2006 年就已经开始了。到目前为止,该教材讲义已经连续使用了 4 年,共经历了 7 轮不断的探索和修改。应该说,它基本上具备了扎实的实践基础和理论基础。

目前,国内各个层次的计算机英语教材种类繁多,亦各具特色。但是,把计算机科学和英语语言训练以及文化内涵相结合的教材就比较少,至于融合技能训练于其中者,则更少。大部分教材往往是选择相关的文章进行讲解,缺乏对整个计算机科学的整体把握和细致的描述,纵深和横向的研究皆有所欠缺;学生的计算机英语学习大体上相当于阅读了几篇关于某一计算机方面的文章,做了一些专业词汇方面的习题,这就难以使读者在宏观上对计算机科学有全面的认识和把握,在微观方面则未能得到有效的、结合计算机技术的语言方面的训练。鉴于此,本教材从语言习得的规律出发,立足于学生的实际,结合学生的专业学习状况,充分研究计算机科学的核心内容和全面把握计算机科学的基本概念,力图为学习者提供一个关于计算机科学的全面、清晰而又简洁的论述。这个论述刻画了基本的计算机科学的发展、原理、概念和应用,并在某些方面涉及其未来。在论述手法上,本书一定程度上体现了科学、社会、生活之间的相互联系及其文化内涵。更重要的是,作为一本教学实践和理论探索的产物,本书特别注重课堂教学设计和课后技能训练设计,其目的在于使本书适于课堂教学实施和学生课后学习,包括课堂教学中的讲练结合的安排、趣味性的实践以及符合成年人特点的研究型学习方法,等等。若结合利用网络和多媒体的教学手段,更可以使教学效果得以有效地提升。

本教材涵盖了计算机科学的基础性知识和基本技能,着眼于培养学生在英文环境下对于计算机知识的理解和计算机技能的运用,同时提高英文综合实际应用能力和计算机科学素养。全部内容共分为 8 个单元,分别反映计算机科学的 7 个重要的方面:

- (1) 计算机概览;
- (2) 计算机硬件;

- (3) 计算机软件;
- (4) 数据库;
- (5) 计算机编程;
- (6) 计算机网络;
- (7) 因特网和 Web;
- (8) 计算机多媒体。

每个单元则又分为如下 3 个部分：① 计算机科学基础学习；② 计算机科学拓展学习和阅读训练；③ 计算机技能应用训练。

本书密切关注、跟踪计算机科学和技术的最前沿，同时对于某些方面也提出了自己的一些见解，比如云计算、CPU 和 GPU 的设计理念和制造技术、Win8 操作系统、SQL Server、Java、路由器、物联网、3D 打印以及移动互联网技术等。

简而言之，本教材在实践的基础上，力求达到以下四个目标：

- (1) 英语能力的实践性整体培养；
- (2) 文化内涵、计算机素质培养、计算机技能训练相融合；
- (3) 实训式课堂教学与学习，语言学习和技术实践交叉进行；
- (4) 关注计算机科学与技术的前沿，关注计算机及其相关行业的本土化。

此外，文字明白晓畅，语言地道，把枯燥、严谨的计算机科学和技术通俗化，也是本书的一大特色。它既可以满足高职高专院校学生学习计算机英语的要求，也可以满足低年级本科学生和一般读者了解计算机科学的自学要求，同时也是进行计算机科学素质教育的优秀读本。

本书是在江苏省教育厅关怀下，在苏州高博软件学院全体领导、教师和学生的支持下，在众多国内外相关教材的基础上产生的成果。对此，谨向他们表示诚挚的感谢。同时，限于编者之水平和时间之仓促，本书中错谬之处，敬请提供宝贵的批评、意见和建议。

王焕科

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2013 年 5 月 18 日

## Preface

What is teaching? How to achieve perfect computer English teaching tasks and the teaching aims? It is really a very complex problem for every teacher with all elements or/and situations involved. As for the teaching for higher-vocational-education students with taking their circumstances, their study at college, the need of the English language, etc. into consideration, maybe our practical teaching could be defined as the following:

Teaching is the course in which after perfect designs for the lessons and every possible procedure, teachers' job is to lead the students into the environment perfectly constructed for them to learn some skills by using and practicing the language, and finally help students actively form their own experience and achievements on the language. And the most important thing is that students play the leading role during the whole course, and teachers should try all means to have students participate in the whole activities of learning. Otherwise, no matter how perfectly teachers have prepared or how hard they teach, it can only be thought of as failure.

Concerning this course, with the above consideration included, certainly, the teaching aim is quite sure that students must be equipped with the quality of computer science in English somehow; hence they can do some effective communication in English in their work. So, based on the aim and the purpose, this book is specially designed for students of higher-vocational-education, seeking for 2 main aims:

1. Practical English abilities are developed further;
2. Basic knowledge and application of computer science can be gained for students' future jobs;

### 1. *A General Principle of the Learning and Teaching on Computer Science Basics*

When Chinese students in this level begin their English learning at college, we must be clear that they face two shifts: one is that they will be focused on their major study, with English learning as an assisting subject for their future; the other is that their aims of English learning will mainly serve themselves for using the language in their future jobs. So, partly based on these reasons, practice is the core of the whole teaching. Showing or performing the steps to solve the problems in English is a good way, and computer English can do it.

### 2. *A Multiple-purpose Textbook—A Description of the Course*

#### **A. Basic Aims**

Based on the students' reality mainly, in brief, it is hoped that this book can strengthen students' understanding and basic techniques on computer science and improve their comprehensive English practical ability so as to help them create their brilliant futures.



## B. Basic Structures

The main structure and contents are as the followings:

### Part I. Computer Science Basics

This part is to specify the important points, concepts and events about computer science spanning all domains through our current or even the future society. We hope the texts could provide a basic, clear, easily-understood subjects and points of computer science.

### Part II. Further Studies on Computer Science

This part is designed to both help students further improve their whole comprehensive English ability and broaden their horizon on computer's future. The passages focus on something new or something not new but significant. It can have students practice reading professional English articles, and have a better understanding of computer science.

### Part III. Practice on Computer Technology Application

This part is specially designed for students to use the learned knowledge or daily experience to solve some practical problems in English in their possible real work. The tasks are not so difficult, but students need real understanding on the text and make actual results. And also it provides an opportunity for students to use their mastered skills in other subjects. This part can be used as electronic assignment for students also.

## 3. What Has to Be Learnt and Taught

The following should be included:

- i. a wide range and a complete series of the basics of computer science;
- ii. the ability to understand professional documents of computer basics in English;
- iii. be quite familiar with the vocabulary of computer and the way of scientific expressing;

## 4. How to Use This Book

Now we have known that it is a multiple-purpose textbook for particular students and special cultivating aims, and it is mainly for developing students' ability of reading scientific documents and practical computer basic skills. And from the angle of both teaching and learning, especially the latter, students' English ability would not be possibly improved without enough reading training and practice. So, enough reading assignment should be given to students first.

1. Students must be led into an environment constructed by the teacher. The teacher should teach by exact performances.
2. The teacher must have students gain enough practice—mainly reading practice here. Enough time outside class should be applied by students, the text reading task should be finished by students, but not the teacher.

Ideally, average 8 classroom lessons of approximately 50/45 minutes each should be spent

on each unit, which should cover all the necessary texts and necessary practicing programs. For students of computer majors, all of the texts should be taught, and the third part can be presented publicly for competition; for students of non-computer majors, the first part is studied intensively, others can be done by the teacher mainly, which can be used to improve students' interest in computer. To be a good teacher, the followings can be inspiration for you:

1. Take an agreeable strategy from the very beginning to the end. And remember we must care more about our students' learning than what we do on our own teachings;
2. Design enough practical questions for students to help them consolidate the skills and the ways they gain by your instructions;
3. Try to use brief, easily-understood and easily-accepted methods and languages to undertake your explanation, try to use interesting elements, and more domain-crossing knowledge with a positive attitude to make perfect teaching and organize the class properly.

However, with the assumption of the allocations of average time of 8 classroom lessons (= 2 weeks) for each Chapter during the 16 weeks in one semester, approximately we can divide the whole time distributed as the followings:

HOW TO TEACH THE PROGRAMS IN EACH UNIT WITH TIME ALLOCATED

PARTS	SPECIFIC CONTENTS	AIM DESIGNED	TEACHINGS SUGGESTED	TIME ALLOCATED
Part I	<i>Computer Science Basic</i>	1. Computer science quality education is made; 2. Good memory and understanding on computer English expressions are familiar with; 3. Basic knowledge and technologies are mastered;	1. Students should be required to pre-study the text, and summarize the main ideas of each section in the margin; 2. teachers show, performance and summarize the main ideas in English for students and together with them study the important and difficult points including necessary vocabulary;	3 Hours
PART II	<i>Fast Reading Practice and Further Studies</i>	1. Further reading practice; 2. Good understanding on some subject about computer;	Read the text fast, finish the attached exercises quickly, write out a brief summary of the whole passage.	2 Hours
PART III	<i>Further Use of Computer Technologies</i>	Practice and consolidate student's understanding and mastery on some necessary computer technologies	1. This part can be used as the assignment for team work; 2. The result should be presented publicly for further discussion to increase students' interest;	2 Hours

The above is just a kind of usual arrangement for regulated teaching. Teachers should adjust their own teaching process if necessary, including adjusting the teaching contents, teaching sequences, for some particular aim or for better results, even omitting some contents, etc.

There are no perfect methods to go on with our teaching of every aspect, but if we can creatively integrate all possible means or methods with the specific elements or factors together, combining the teaching aims and tasks, and always focus on improving our teaching abilities, things will be much better.



We are trying to make the writings readable, cultural, and close to the reality. The book itself is not only a textbook, but a workbook as well.

## ACKNOWLEDGEMENTS

First of all, I would like to express my sincere gratitude to the managements of GIST (Global Institute of Software & Technology). It is quite certain that the book would not exist were it not led and supported by them from time to time.

Here I would like to give special thanks to three teachers of computer science: Prof. Xu Yuxiao (须毓孝), who specializes in **C# Language** and **Software Engineering**, associate Prof. Zhu Mingyu (朱明宇), Chen Yong (陈勇) who specialize in **Network System** and **Software** respectively. The three specialists give much advice on how to compose the content, especially on the third part. I hope I can acquire more information from them continuously in the future, on both teaching contents and teaching methods. Finally I must say that all of us—Duan Jiangfeng (端剑峰), Ma Lele (马乐乐), Li Yan (李艳), Pan Liqun (潘丽群), Li Yuefeng (李月峰), Ding Ronghui (丁荣晖), Chen Xuefeng (陈雪峰), Zhu Yi (朱佺), Huang Qiong (黄琼) and I, worked hard during the past 4 years with perfect collaboration.

For better effect and use, this edition has been made many changes and improvements, and one of the changes is that more effective and practical exercises are added to the relevant subjects. It is hoped that this book can make some contribution to China's computer English teaching.

Editor-in-chief: 王焕科

May 2<sup>nd</sup> 2013

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## Unit 1 A Survey on Computer

We must know that we are in an age that is quite different from any other previous times—information is everywhere in so many types, we'll be upset all day without a mobile phone with us, and we'll feel isolated if we are off the Internet for a while. Digital devices, especially computers, have been our daily tools for our daily life and daily jobs. Please have a quick look at the following daily or office tools, and try to fill in the following table for the digital devices.



Digital devices are used so commonly and widely today in our life that we can't imagine how we can move on without them. Please write out the names of the above products in English. And then, try to fill in the following table with the digital devices you own in English also. (The above listed digital devices frequently used at office or home are: multimedia player, smart phone, projector, digital camera-SLR (Single Lens Reflex) camera, printer, fax machine, scanner, tablet computer, desktop computer, Ultrabook computer, laptop (notebook) computer and unit-combined desktop computer)

Now write out the specifications of the following digital products you use or you are familiar with.

Digital Devices	Brand	Model	Serial Number
Mobile Phone			
Desktop Computer			
Laptop Computer			
Tablet Computer			
Ultrabook Computer			

## Part I Computer Science Basics

Today, computer technology offers a big number of choices for entertainment, information, and communication. We're using so new products, dealing with so many and complex problems and the most important thing is that these problems will deeply influence our culture, politics, and economy. We naturally find that human behavior has changed a lot since new technologies came, especially the computer science. For example, people can easily make real-time communication through QQ, Skype, MSN, etc., make purchases and work at home by Internet, and more and more materials can be edited on a computer and printed at the same time conveniently. We also find that some video and audio materials can be presented on a computer for entertainment and study. Without a computer, our daily life and most office jobs cannot be in order any more. So we really need to know more about computer: how does it work? What is it made up of? And furthermore, we should think about how it will affect our future life.

### SECTION 1. A DIGITIZED WORLD

It is quite sure that our world is changing into a digital one. It is the computer that plays more and more important role in this digital world. Every day new digital inventions are created constantly because of their economic benefits. The question is that how it is so efficient and effective? This is because we are using the digital technology. With digital technology, people can use digital devices which use electronic circuits to represent data to rapidly process information. In the 1940s and 1950s, people began to develop digital electronic devices, and at the same time, electronic components were developed also. Later, transistors and integrated circuits were developed gradually, so the electronic devices were smaller and smaller in size, but more and more powerful in the aspect of function.

During World War II, engineers built the first digital computers to break codes and calculate complex mathematical problems. But by the 1950s, only a few computers were used for business data processing applications, because computer science is a very technical and professional skill. Even when the first personal computers were used in 1976, they seemed little useful for their owners, because there were no useful software applications. But since there were various kinds of software, the situation has changed. And since then, computers are increasingly becoming handy devices especially after the use of Internet. They have replaced typewriters for creating documents, old calculators for number processing, and have



been widely used for both jobs and entertainment.

The large-scaled use of computers happened when the Internet was opened to the public with the cost of making a computer being lowered. The **Internet** is a global computer network, which was developed as a military project at the beginning, and then it was handed over to the US National Science Foundation for research and academic use. When commercial Internet use was first allowed in 1995, companies began to offer Internet access and e-mail service to more and more people. At present, e-commerce has become a kind of lifestyle of many people, and most businesses and shops have their own Web sites. Online purchase and online marketing are very popular. **E-mail**, a form of electronic communication, makes life more efficient and convenient. And more users try to buy a computer and join the digitized times. In addition to e-mail, the Internet offers many ways for people to communicate such as QQ in China. The Internet has changed the old idea of communication, and it has also created many new types of interpersonal communications and relationships.

1. large-scaled  
大规模的
2. sci-fi  
科幻小说
3. sophisticated  
复杂的
4. synthesizers  
语音合成器

All of the use on computers is based on **digitization**, which converts texts, numbers, sound, photos, and video into data represented by binary digits of 1s and 0s. Inside a digital device, the data of 0s and 1s can be accurately and rapidly processed. And since digitization became popular, many things in our life have changed. For example, digital image making has changed the photographic industry. Now more than 90% of all cameras sold are digital. Digital video increases special effects in movies, new trends in 3-D animation and portable videos, and the film industry has become much more technological, which makes more sci-fi and magic films pour before audience. On the other hand, consumers promoted a lot for digitization. For example, because more and more people like playing computer games, computer professionals will try to do more research on faster computers and more sophisticated graphics processing technique, which both improves the function and lowers the cost. Just like digital image making, online music stores are transforming the industry, changing the way music is marketed, bought, and played. Human speech can also be digitized. Weather reports on weather band radio are read by computerized voice synthesizers.

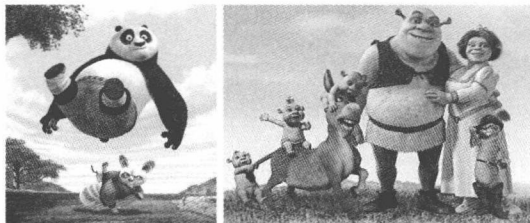


Figure 1-1: Applying computer technologies is a very popular way to create new styles for present movie industry. The left is Kung Fu Panda, the right is Shrek, which were made by DreamWorks SKG.

So we can say that with the development of computer science, or more exactly, the development of digital technology, our human society has been deeply affected. The world is smaller and smaller. Social management, intellectual property, the way we view the world, and so on, have been greatly changed. We must realize that learning about digital technology is not just about circuits and electronics, nor is only about digital tools, such as computers and portable music players. What we must be aware of is what role the digital technology plays in our modern life. Before computer science, culture, economic, political traditions have to change. We know that during the last 3 years, a Chinese mobile phone manufacturer—Beijing Xiaomi (小米) Science & Technology Co., Ltd has achieved great success in both making money and brand promotion, especially the latter. The question is how? Here we can simply conclude that it owed to the perfect e-commerce strategy based on current computer science. So if we know how this technology works and think about how it will be effective, we can understand many problems about privacy, security, and intellectual property. And only based on the understanding, can we better adapt to the new digital age coming to us. Furthermore, we can be a good consumer, and we have the power to watch into the future.

## SECTION 2. WHAT IS A COMPUTER?

Till now, we already know some about the digital devices, and we still know that it was just these devices that promote the digitization and hence our world has changed and will go on changing with the development of them. So, what is exactly a computer? The word **computer** has been formed in the English language since 1646, but before 1940, you might find that a computer is a person who does calculations! At that time, if a machine was used to do calculations, it was called as a calculator, not a computer. The modern definition and use of the term computer appeared only in the 1940s, when the first electronic computing devices were developed. Computers do so many things and have so many kinds of shapes and sizes that it is difficult to collect their common characteristics into a precise definition. But from its core, we can say that **a computer is a multipurpose device that consists of hardware and software to accept input, process data, store data, and produce output, all of which are based on a series of stored instructions.** Now, a real computer should include some basic equipment, they are the memory, the monitor, and the keyboard, hard disk, etc., because one cannot really use a computer to do anything without these basic equipment.

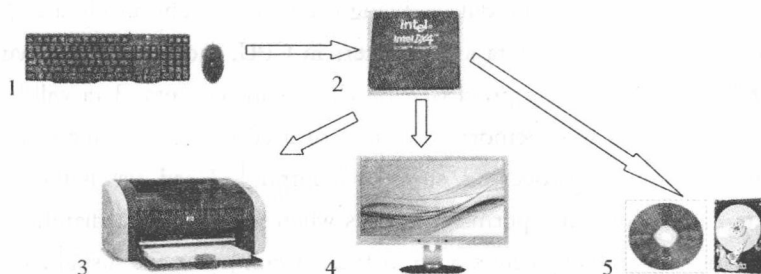


Figure 1-2: 1. Keyboard 2. CPU 3. Printer 4. Monitor 5. CD.

*Input (Data) is entered through a keyboard, or other input devices, such as mouse, scanner, or digital camera. Then data is processed in CPU (Central Processing Unit), and after the process, it will be transmitted to a monitor, or a printer to show the result, or it is stored on CDs. So a computer can be defined by its ability to accept input, process data, store data, and produce output, all are based on a set of instructions from a computer program.*

**1. Input.** Computer input is whatever is typed, submitted, or transmitted to a computer system. Input can be supplied by a person, by the environment, or by another computer. Examples of input include words and symbols in a document, numbers for calculation, etc. An input device, such as a keyboard or a mouse, gathers data and transforms it into a series of electronic signals for the computer to store and process. Common input devices are: keyboard, mouse, scanner,