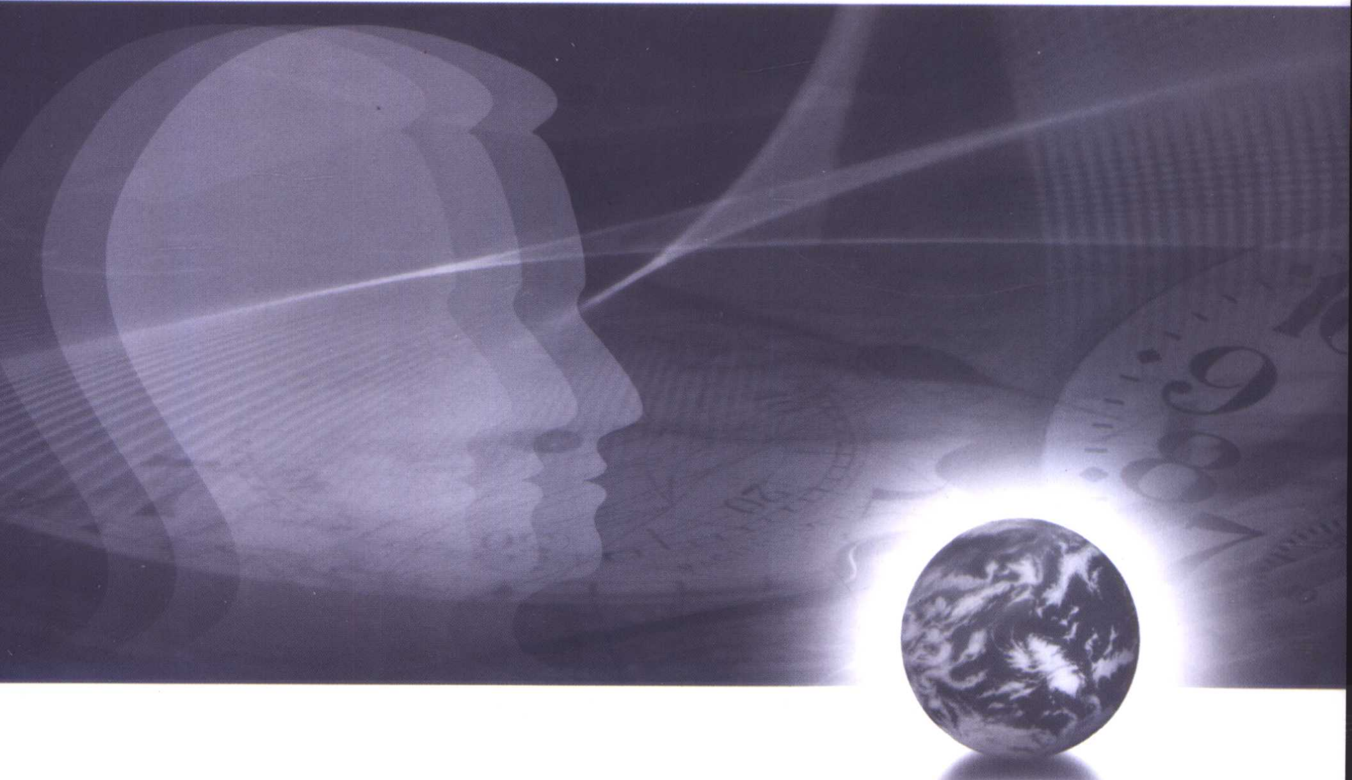
高等院校计算机科学与技术
“十五”规划教材

计算机专业英语



张 玲 范玉涛 刘玉玫 等编著

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本书以目前国外最新的计算机原版教材和计算机技术文章为基础编写。内容覆盖了计算机概述、计算机基础、计算机硬件、软件、计算机程序、软件工程、数据通信、网络、多媒体、计算机安全、电子商务等内容。本书每章内容包括课文、词汇、科技英语语法、练习、参考译文和阅读材料几部分。这些都有利于提高读者阅读计算机英语文献的水平，同时也帮助读者掌握大量的专业词汇。

本书可作为大专院校计算机及 IT 相关专业的专业英语教材使用，也可作为广大 IT 业技术人员的学习参考书。

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出版说明

适逢高等院校计算机专业教育改革的关键时期，为配合相关的教材建设，机械工业出版社会同全国在该领域内享誉盛名、具备雄厚师资和技术力量的高等院校，包括清华大学、上海交通大学、南京大学、电子科技大学、东南大学、西安电子科技大学、解放军理工大学、北京科技大学等重点名校，组织长期从事教学工作的骨干教师，集思广益，对当前高等院校的教学现状开展了广泛而深入的研讨，继而紧密结合当前技术发展需要并针对教学改革所提出的问题，精心编写了这套面向普通高等院校计算机专业的系列教材，并陆续出版。

本套教材内容覆盖了普通高等院校计算机专业学生的必修课程，另外还恰如其分地添加了一些选修课程，总体上分为基础、软件、硬件、网络和多媒体五大类。在编写过程中，对教学改革力度比较大、内容新颖，以及各院校急需的并且适应社会经济发展的新教材，优先选择出版。

本套教材注重系统性、普及性和实用性，力求达到专业基础课教材概念清晰、深度合理的标准，并且注意与专业课教学的衔接；专业课教材覆盖面广、深浅适中，在体现相关领域最新发展的同时注重理论联系实际。全套教材体现了教育改革的最新思想，可作为高等院校计算机科学与技术专业的教学用书，同时也是培训班和自学使用的最佳教材。

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前　言

计算机自诞生之日起，就一直以前所未有的速度发展着。计算机的大部分新技术是用英文发表的。作为未来IT业的技术人员，必须具有熟练阅读计算机专业文献的能力，以便及时了解计算机发展的新技术和新动向。因此大专院校计算机及其相关专业纷纷开设了计算机专业英语课程。

由于计算机飞速发展，计算机技术文献日新月异，计算机英语的教材也必须能够及时反映计算机发展的新技术。因此本书以目前国外最新的计算机教材和计算机文献作为英文素材，突出了新技术与实用技术的特点，共分18章，涵盖了以下内容：

第1章计算机概述。介绍计算机的诞生和发展史、计算机类型。第2章计算机系统基础。介绍计算机工作原理、计算机的构成。第3章计算机硬件结构。介绍主板、主存储器、CPU、扩展板等。第4章计算机输入和输出设备。介绍输入设备、输出设备和外存储器。第5章CPU。介绍CPU的工作原理、性能指标，以及CPU的发展史。第6章组装计算机。介绍如何组装计算机。第7章计算机软件。介绍计算机软件和计算机程序基础，软件分类以及软件盗版。第8章系统软件。介绍系统软件基础，操作系统、实用程序、设备驱动程序和语言翻译程序，流行的操作系统。第9章应用软件。介绍文档制作软件、电子表格、数据库和教育培训软件。第10章计算机程序设计。介绍程序设计步骤、算法、控制结构以及程序设计语言。第11章软件工程。介绍软件工程基础、软件工程发展及其与相关领域的比较。第12章数据通信。介绍数据通信原理、通信信道、通信介质和一些流行的数据通信新技术。第13章计算机网络。介绍网络工作原理、网络种类、拓扑结构、协议、网络构造和网络的架构。第14章Internet。介绍Internet的产生、应用、网络文化、网络技术和接入方式。第15章多媒体。介绍多媒体的组成元素、多媒体设备和多媒体应用。第16章数据安全。介绍计算机出错的原因、计算机病毒以及计算机的防护。第17章电子商务。介绍电子商务及其发展史、如何通过网络赚钱、企业间的电子商务、如何接受电子商务。第18章计算机图形学。介绍计算机图形学的定义、图形表示方式、图形的构成、图形软件、图形学的应用。

本书每章的内容由课文、生词和计算机词汇、科技英语语法、练习、参考译文和阅读材料几部分构成。为了增加课文的直观性，使读者更容易理解计算机的词汇，文章中还配有一些插图和示意图。

本书主要由张玲、范玉涛、刘玉玫编写，参加本书编写的人员还有陈芝玲、孙琪、孟传、李小梅、潘爱先、高宁、于晓娜、姚远方。

由于计算机新技术不断产生，计算机新词汇不断出现，书中有些新词汇尚无规范译法，加上作者水平有限，书中难免有错误之处，还恳请广大读者指正。

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目　　录

Part 2 Computers Software

Part 3 Computer Application

Part 1 Fundamentals of Computers

Chapter 1 Introduction to Computers

Objective

After reading this chapter, the reader should be able to:

- Explain the strong impact that the computer had made on the world.
- Know some early groundwork before the inception of computer and the basic principle of computer.
- Differentiate among the five generations of computers according to their technical character.
- Know the several types of computers and their own characters.

1.1 Inception of Computers

The computer is an acknowledged symbol of 20th century technology——a tool that has transformed businesses and lives around the world, increased productivity, and opened access to vast amounts of knowledge. Computers relieved the drudgery of simple tasks, and brought new capabilities to complex ones. Engineering ingenuity fueled this revolution, and continues to make computers faster, more powerful, and more affordable.

In the first half of the 20th century, a steady stream of technical innovation transformed people's lives——the automobile, the airplane, farm machinery, and the washing machine. In many ways, new technologies were no longer a surprise. Then came a new machine——the computer, which astonished the world and promised to remove other forms of drudgery from life, such as tedious calculations or assembly line tasks. The computer would soon evolve from an elaborate calculator to a complex system of enormous capability. The computer's impact would prove to be immense, a fact recognized by the magazine Time in 1982, when it dubbed the computer "Man of the Year." Before the century was over, the computer had become an integral part of every major industry, and had begun to open new worlds through the Internet.

1.2 History of Computers

The history of the computer has been one of dazzling feats. Early groundwork included Blaise Pascal's adding machines (1600s); Marie Jacquard's weaving looms (1801); Charles Babbage's

Analytical Engine (1840s); and Herman Hollerith's punch-card program (1880s). In 1943, the British logic calculator, Colossus, cracked complex Nazi codes in hours, and turned the tide in favor of the Allies. In 1946, America's ENIAC performed 5000 additions and subtractions per second. In the 1980s supercomputers performed 10 trillion calculations per second——what would take 10 million years on a handheld calculator.

Among the more dazzling feats were those that enabled these machines to store information and read programs. The first hurdle in this transformation was accepting the concept of a universal machine, as outlined in a 1945 paper by Alan Turing. He laid out the principles for a machine that could store programs as well as data, and quickly switch to perform tasks as diverse as arithmetic, data processing, and chess playing. Independently, building on the work of ENIAC engineers Presper Eckert and John Mauchly, von Neumann's EDVAC report came to the same conclusion.

The idea of one machine that could be applied to many tasks was foreign to the scientific world of 1945. Even in 1956, Howard Aiken of Harvard University wrote "If it should turn out that the basic logics of a machine designed for the numerical solution of differential equations coincide with the logics of a machine intended to make bills for a department store, I would regard this as the most amazing coincidence that I have ever encountered." Indeed, this "coincidence" came to pass, and it has been amazing.

1.3 The Five Generations of Computers

The history of computer development is often refered to in reference to the different generations of computing devices. Each generation of computers is characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, more powerful and more efficient and reliable devices.

1.3.1 First Generation (1940–1956): Vacuum Tubes

Beginning with ENIAC and continuing into the late 1950s, the first generation computers used vacuum tubes for circuitry and magnetic drums for memory, and were often enormous, taking up entire rooms. They were very expensive to operate and in addition to using a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions. First generation computers relied on machine language to perform operations, and they could only solve one problem at a time. Input was based on punched cards and paper tape, and output was displayed on printouts.

The UNIVAC and ENIAC computers are examples of first-generation computing devices. The UNIVAC was the first commercial computer delivered to a business client, the U.S. Census Bureau in 1951.

1.3.2 Second Generation (1956–1963): Transistors

Two key engineering developments in the late 1940s would have a dramatic impact on future generations of computers. One is the development of the transistor, by John Bardeen, Walter H.

Brattain, and William B. Shockley in 1947. Transistors replaced vacuum tubes and ushered in the second generation of computers. The transistor was invented in 1947 but did not see widespread use in computers until the late 50s.The transistor was far superior to the vacuum tube, allowing computers to become smaller, faster, cheaper, more energy-efficient and more reliable than their first-generation predecessors. Though the transistor still generated a great deal of heat that subjected the computer to damage, it was a vast improvement over the vacuum tube. So it became the de facto technology for building computers.

Second-generation computers still relied on punched cards for input and printouts for output. But it moved from cryptic binary machine language to symbolic, or assembly languages, which allowed programmers to specify instructions in words. High-level programming languages were also being developed at this time, such as early versions of COBOL and FORTRAN. Another new development that started in the early 1950s came to fruition during the second generation, it is the invention of ferrite core memories by An Wang.MIT's Whirlwind project expanded on Wang's basic patent and developed random access memory (RAM), which would make information retrieval quick and easy.

1.3.3 Third Generation (1964–1971): Integrated Circuits

The development of the integrated circuit was the hallmark of the third generation of computers. The first integrated circuit was developed in the 1950s. Integrated circuits are used for a variety of devices, including microprocessors, audio and video equipment, and automobiles. In 1964, the IBM360 pioneered the use of integrated circuits on a chip. Hundreds of Transistors were miniaturized and placed on silicon chips, which were as small as fingertips, but drastically increased the speed and efficiency of computers. Integrated circuits are often classified by the number of tranistors and other electronic components they contain:

- SSI (small-scale integration): Up to 100 electronic components per chip.
- MSI (medium-scale integration): From 100 to 3,000 electronic components per chip.
- LSI (large-scale integration): From 3,000 to 100,000 electronic components per chip.
- VLSI (very large-scale integration): From 100,000 to 1,000,000 electronic components per chip.
- ULSI (ultra large-scale integration): More than 1 million electronic components per chip.

Instead of punched cards and printouts, users interacted with third generation computers through keyboards and monitors and interfaced with an operating system, which allowed the device to run many different applications at one time with a central program that monitored the memory. Computers for the first time became accessible to a mass audience because they were smaller and cheaper than their predecessors.

1.3.4 Fourth Generation (1971–Present): Microprocessors

The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip. What in the first generation filled an entire room could