21世纪

信息管理与信息系统专业规划教材

信息技术专业英语

甘艳平 叶焕倬 主编
陈聪 顾向明 熊瑛 编著

清华大学出版社

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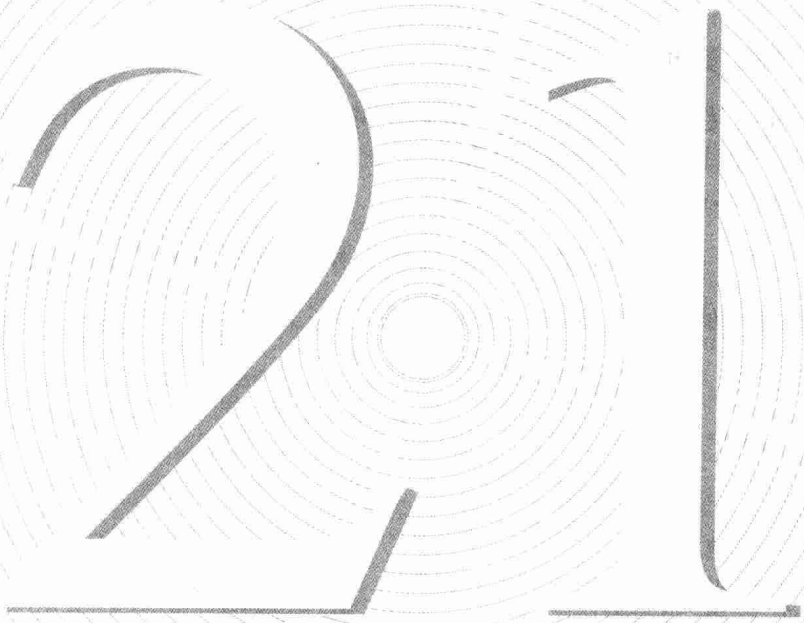

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内 容 简 介

本书由信息技术专业以及英语专业两个不同领域的专家合作编写，介绍了信息技术领域不同方向科技英语的用法和特点，覆盖了众多的信息技术热点，如操作系统、程序设计语言、计算机体系结构、网格、嵌入式系统、机器学习、信息安全、移动商务、生物信息学和无线网络等。结合科技英语使用的要求，本书从阅读、写作和翻译三个方面进行了详细的讲解并提供有针对性的训练，相信读者在使用该书后不仅能够较好地掌握信息技术专业英语的特点和用法，而且对信息技术的相关方面也会有更深的了解。

本书可供大学本科高年级学生以及研究生作教材使用，也适合那些急需提高自己科技英语水平的 IT 从业人员和对信息技术专业英语感兴趣的人士自学。

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编委会

21世纪序

根据国家教育部1998年7月6日公布的《普通高等学校本科专业目录》的内容，将原经济信息管理、图书情报学、科技信息管理、林业信息管理和管理信息系统等专业合并为管理学科门类中的信息管理与信息系统专业。目前，我国已有二百多所高等院校设置了信息管理与信息系统专业。该专业的发展伴随着世界信息化的发展而发展，为我国培养了大量的信息化专门人才。

网络化、信息化、全球经济一体化是当今世界的主要特征。20世纪90年代，信息技术不断创新，信息产业持续发展，信息网络广泛普及，信息化成为全球经济社会发展的显著特征，并逐步向一场全方位的社会变革演变。21世纪，信息化对经济社会发展的影响更加深刻，信息资源日益成为重要的生产要素、无形资产和社会财富。我国信息化发展的进展十分迅速。

基于此，信息管理与信息系统专业人才培养的任务十分艰巨。首先要定位，再定向，还要定措施。不同的高校要根据自己的特色来定位，如：以经、法、管理为主的综合性人文社科大学，其信息管理与信息系统专业就要定位在和经济、法律、管理的结合上，培养的人才主要适合在经济管理部门、司法部门、企事业单位等从事信息系统建设和管理以及科学研究等工作。定向的具体内容由培养目标来确定，本专业直接以信息化建设的人才需求为培养目标与标准，培养熟练掌握现代信息技术手段和方法，具有坚实的现代管理科学理论知识，具备较强的计算机应用能力的综合型、实用型的高级专门人才。定措施则是要确定对培养目标的具体实施过程和方法，包括师资要求、全程教学计划和教材建设等。

现各个高校在信息管理与信息系统专业的教材使用上五花八门，教材主要由任课教师自己选定。计算机方面的教材主要选用计算机科学与技术专业的教材，管理方面的教材主要采用管理学科的教材。尽管近年来一些出版社陆续出版了几套信息管理与信息系统专业的教材，但仍然不能满足教学的需要。根据教育部1998年信息管理与信息系统专业课程要求，结合中国高等院校信息系统学科课程体系课题组撰写的《中国高等院校信息系统学科课程体系2005》（征求意见稿）（清华大学出版社，2005年11月）的内容，我们组织长期从事信息管理与信息系统专业教学和研究的教师，在清华大学出版社的大力支持下，经过多次讨论和研究，组织编委会，制定教材编写规划，审定编写大纲，并采取主编负责制，层层把关，力争使本套教材成为具有系统性、完备性的高水平、高质量的信息管理与信息系统专业教材。

本套教材的主要特点是：

1．系统性。教材自成体系，系统地体现本专业的知识体系和结构。

2．完整性。教材能完整、准确地反映本专业的教学内容，满足培养高层次人才的

需要。

3．新颖性。教材要反映本学科的最新发展动态和研究成果。

4．理论性。教材注重理论基础的培养，使学生具备扎实的理论知识。

5．实用性。教材注重理论与实践结合，把培养学生分析问题、解决问题和实际动手能力作为一项重要的内容予以体现。

本套教材的成功出版，凝聚了众多长期从事信息管理与信息系统专业建设的专家、学者及相关人员的心血。我们殷切希望从事信息管理与信息系统专业的教育工作者对本套规划教材提出宝贵建议，使教材质量不断得到提高。让我们共同为培养高素质的信息化人才而努力。

刘腾红　教授

本规划教材编委会主任

2007 年 8 月

21世纪 前言

本书以国外最新的信息技术方面的图书和文章为基础编写，涵盖了广泛使用的信息技术术语，可以让读者了解最新的知识，跟上时代的步伐。选题虽然内容深入，但语言浅显，通俗易懂，融科学性、知识性、实用性和趣味性为一体。

在题材取舍上，本书覆盖了众多重要和前沿的信息技术专题，如操作系统（operating system）、程序设计语言（programming language）、计算机体系结构（computer architecture）、网格（grid）、嵌入式系统（embedded system）、机器学习（machine learning）、信息安全（information security）、移动商务（mobile commerce）、生物信息学（bioinformatics）和无线网络（wireless network）等。同时，还针对阅读文章编写了一些题目，如阅读理解，加深读者对所学内容的理解。本书的主要特色在于，每一单元后都会有一些针对阅读文章的练习题，练习遵循由简到繁、由易到难、由浅到深的原则，逐步深入，让读者逐步掌握信息技术知识及英语表达能力。另外，还有关于信息技术的英语写作及翻译方面的技巧，这两部分可以让读者逐步了解有关论文写作的常识和翻译常识。

本书分为 10 个单元，一学期学完，进度大约为每三周学习两个单元。每单元由三大部分组成，分别如下：

- 第一部分　阅读（Reading）

Text A 是一篇长度大约为 1000 字的文章，后面是生词的注解，这些生词按字母顺序排列，以方便读者查找；然后是对课文重点和难点的注释，以帮助读者理解课文并掌握常用句型和词组；接着是对该阅读文章的一些练习活动，活动的形式因文章而异，有时是判断对错，有时是提问，有时是针对词汇的练习（填空或选择）。

Text B 通常是对第一篇文章（Text A）的一个补充，其文章的主题和第一篇类似，这样围绕该主题的一些词汇就会重新出现，以利于读者加强对这些词的印象，起到巩固复习的作用。在该文章后面同样有生词注解来帮助读者理解文章，接着是练习，也是根据文章的内容和难易程度以及出现的词汇来设计。读者通过练习可以加强对文章的理解，同时也了解一些词汇和词组的用法。

- 第二部分　写作（Writing）

Writing Salon 部分介绍学术论文常用的结构模式、文体特点（如偏重于使用被动语态）以及一些具体的写作方法。

Writing Activity 是些针对写作的练习，逐步让读者掌握科技论文写作的模式及特点。

- 第三部分　翻译（Translation）

Translation Seminar 部分遵循由简到繁、由易到难、由浅入深的原则。开始，给读者安排一些简单的词语翻译，其次是一些结构简单的句子翻译，再次是一些稍微复杂的长句子

和短篇章的翻译，最后是文章的翻译。该部分告诉读者应注意的科技英语的特点，翻译此类文章应当注意的问题和翻译的技巧。

Translation Task 是针对翻译讲座的翻译练习，该部分可以加强读者对翻译技巧的掌握。

另外，在全书的后面作为附录还附有每个单元的练习答案及每篇文章的汉语译文，以备读者参考之用。

本书由多位在“211”大学执教的资深教师合作编写，这些老师来自于英语与信息技术两个不同的领域，很多人多次赴欧美学习、工作和访问，熟知国际上的热点与前沿，希望合作的成果能够反映信息技术领域国际化语言的特点及发展趋势，涵盖 IT 英语的各个重要方面。全书由甘艳平、叶焕倬统稿，陈聪编写第 1～第 3 章，顾向明编写第 4、第 6 和第 9 章，熊瑛编写第 5、第 7 和第 10 章，甘艳平编写第 8 章。同时感谢研究生何玉凝、高芳等所做的工作。

本书的宗旨在于让读者在轻松愉快的学习中了解信息技术知识、熟悉 IT 专业英语，读者可以是 IT 从业人员或学生，也可以是对该领域感兴趣的英语基础较好的人士。本书可作为高等院校信息类专业本科高年级学生和研究生专业英语教材，也可供参加计算机行业各种考试的人员备考之用，亦可供对现代信息技术及专业英语有兴趣者自学之用。

编者

2009 年 4 月于珞珈山

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Unit One
Computer Architecture

Part One Reading

Text A System Architecture

A stand-alone computer system, which is most commonly seen as a desktop machine (a PC or workstation) intended for a single user, has the basic organization that has changed little from that found in earlier generations, despite the massive improvements in implementation technologies that have occurred in recent years.[1] The computer's main hardware components continue to be a CPU, a main memory, and an IO subsystem, which communicate with one another over a system bus. Its main software component is an operating system that performs most system management functions.

The key hardware element is a single-chip microprocessor, embodying a modern version of the von Neumann architecture. The microprocessor serves as the computer's CPU and is responsible for fetching, decoding, and executing instructions. Data and instructions are typically composed of 32-bit words, which constitute the basic information units processed by the computer. The CPU is characterized by an instruction set containing up to 200 or so instruction types, which perform data transfer, data processing, and program control operations that have changed little over the years. The CPU may be augmented by on-chip or off-chip coprocessors that implement such specialized functions as managing the graphical user interface (GUI).

The role of the computer's main or primary memory M is to store programs and data as they are being processed by the CPU. M is a random-access memory (RAM) comprising a linear store of items (usually 8-bit bytes), each of which is assigned a unique address that permits the CPU to read or change (write) its contents via loading or storing instructions, respectively. M is backed up by a much larger but slower secondary memory, typically implemented by hard disks employing magnetic or optical storage technology and forming part of the IO subsystem. As in the PowerPC, an intermediate memory called a cache may also be inserted between the CPU and M. Thus we find a hierarchy of memory devices composed of the CPU's registers, the cache, the main memory, and the secondary memory. This complex structure results from the fact that the fastest memory devices are also the most costly. The memory hierarchy is intended to provide the CPU with fast access to large amounts of data at a fairly low cost.

The purpose of the IO system is to enable a user to communicate with the computer. IO devices are attached to the host computer by means of IO ports, whose function is to control data transfers between IO devices and main memory. Active programs communicate with IO ports in much the same way as they communicate with M. An IO device is assigned a set of memory-like addresses, which allow input and output instructions to be implemented in essentially the same way as loading and storing instructions, respectively. However, the CPU usually takes much longer to access a word stored in the IO system than to access a word stored in M—most IO operations are quite slow.

The traditional input and output devices are a keyboard and screen (provided by a CRT or a flat-panel display), respectively, which are convenient for handling textual information. Adding a pointing device like a mouse makes a display screen into an input device, permitting communication between the user and the computer via graphical images. Special software, such as the Windows interface found in personal computers, supports GUIs. Audio interfaces for speech generation and recognition extend the computer into a multimedia system. A major component of most IO systems is a set of secondary memory devices that provide bulk storage of programs and data. Rapid transfer of information between primary and secondary memories is often a key factor in a system's overall performance.

Their small size and low cost have made it feasible to use miniature general-purpose computers, referred to as microcontrollers, for tasks that previously employed either special-purpose control circuits or had no control logic at all, for example, controlling a home washing machine or the ignition system of a car.[2] Programs stored in a read-only memory (ROM) that forms a part of the main memory tailor a microcontroller to a particular application. The microcontroller is built into, or embedded in, the controlled device, often in a way that is invisible to the end user. Hence an embedded microcontroller that has been programmed to handle the application in question can replace application-specific control circuits, often at substantial cost savings. Furthermore, by bringing the power of a computer to bear on relatively mundane applications, manufacturers can readily introduce many new features to improve flexibility, performance, or ease of use. As a result, most computers in operation today are microcontrollers in embedded systems.

The linking of computers to form networks of various types has become an increasingly important feature of modern computing. A computer in an office or industrial environment is typically linked to other computers in the same organization via communication links that can be thought of as an extension to the system bus. The linked computers then form a small, closed computer network known as a local-area network (LAN) or Intranet. The physical links between the computers can be built in various ways, including electrical cables, optical fiber, and radio (wireless) links. Special IO programs (communication software) enable the computers on the network to exchange information and access common computing resources called servers.

Computer networks have several advantages over the large, centralized (mainframe) computers that they have come to replace. The individual user has direct access to a computer

(his or her personal computer) that can quickly and conveniently handle many routine computing tasks. Users can also access computing facilities that they need less frequently, for example, a high-performance supercomputer or costly IO equipment, via the computer network. Many widely dispersed users can share such specialized equipment via the network, thus lowering its cost to individual users. Furthermore, a computer network provides useful new services such as electronic mail, remote library services, and on-line shopping.

Several LANs can be linked together by various means including the telephone networks, which increasingly are designed to accommodate digital data transmission, including video data, as well as the traditional (digitized) voice communication. A collection of linked LANs forms a large computer network that can be worldwide in scope. In the early 1990s a network of this sort known as the Internet emerged, which because of its huge size and global reach—an estimated 16 million server sites in 180 countries with 72 million users in 1997—has had a profound impact on the way people compute and communicate. [3]

In the early years the Internet was used almost exclusively to transfer text files such as electronic mail (e-mail) messages. This situation changed fundamentally in 1989 when scientists at CERN (Centre European pour la Recherche Nucleaire) in Geneva overlaid on TCP/IP a new, high-level protocol called http (hypertext transfer protocol) and an associated programming language html (hypertext markup language) to permit the linking of diverse file types—text, still pictures, movies, sounds, etc.—in a simple way.[4] This combination enabled users to create multimedia files easily and transmit them rapidly over the Internet. The result is an enormously rich collection of easily accessible data that has come to be known as the World Wide Web.

(1, 196 words)

New Words

accommodate	v. 调节，适应
application-specific	adj. 专用的，特定的
augment	v./n. 增加，添加，扩充
bit	n. （二进制）位，比特
byte	n. （二进制的）字节
cache	n. 高速缓存
coprocessor	n. 协处理器
digitized	adj. 数字化
embody	v. 配备；具体化
fetch	v. 取数据；取数据的程序
hierarchy	n. 层次
ignition	n. 点火，点燃
Intranet	n. 企业内部网络
miniature	adj. 微型的，缩小的
mundane	adj. 世俗的，平凡的

overlaid	v. 覆盖
protocol	n. 草案，协议
singlechip	n. 单片机
tailor	v. 设计，制作；剪裁

Proper Names

bulk storage	大容量存储器
communication link	通信链路
control device	控制器，控制设备
digital data transmission	数字数据传输
general-purpose computer	通用计算机
hardware component	硬件部件，硬件成分
host computer	主（计算）机
magnetic storage	磁存储器
memory hierarchy	存储器分级体系，存储层次
optical fiber	光导纤维，光纤
optical storage	光存储器
pointing device	指示器，指点器
secondary memory	辅助存储器

Abbreviations

CERN	(Centre European Pour la Recherche Nucleaire) 欧洲粒子物理研究所
CRT	(cathode ray tube) 阴极射线管
HTML	(hypertext markup language) 超文本链接标示语言
HTTP	(hypertext transfer protocol) WWW 服务程序所用的协议
LAN	(local area network) 局域网
PowerPC	(IBM 和 Apple 合作推出的) Power 型个人计算机
RAM	(random-access memory) 随机存取存储器
ROM	(read-only memory) 只读存储器
TCP/IP	(transmission control protocol/Internet protocol) 传输控制协议/网间协议

Notes

1. A stand-alone computer system, which is most commonly seen as a desktop machine (a PC or workstation) intended for a single user, has the basic organization that has changed little from that found in earlier generations, despite the massive improvements in implementation technologies that have occurred in recent years.

   "which is most commonly seen as a desktop machine (a PC or workstation) intended for

a single user" 修饰主语 system，"that has changed little from that found in earlier generations, despite the massive improvements in implementation technologies that have occurred in recent years" 修饰宾语 organization。

2. Their small size and low cost have made it feasible to use miniature general-purpose computers, referred to as microcontrollers, for tasks that previously employed either special-purpose control circuits or had no control logic at all, for example, controlling a home washing machine or the ignition system of a car.

"small size and low cost" 可以翻译成："由于体积小、费用低"。

在科技英语的翻译中，有时将名词词组扩展成句子。

e.g. The slightly porous nature of the surface of the oxide film allows it to be colored with either organic or inorganic dyes.

氧化膜表面具有轻微的渗透性，因而可以用有机或无机染料着色。

3. In the early 1990s a network of this sort known as the Internet emerged, which because of its huge size and global reach—an estimated 16 million server sites in 180 countries with 72 million users in 1997—has had a profound impact on the way people compute and communicate.

"which because of its huge size and global reach—an estimated 16 million server sites in 180 countries with 72 million users in 1997" 修饰"a network"。

这里的 "impact" 是名词，是 "影响" 的意思，impact on...：对……有影响。

e.g. Modern science and technologies have great impact on society as a whole.

现代科学技术对整个社会产生了巨大的影响。

e.g. Unnecessary expenses will by no means have impact on our company's benefits.

不必要的开支毫无疑问地会影响我们公司的利益。

4. This situation changed fundamentally in 1989 when scientists at CERN in Geneva overlaid on TCP/IP a new, high-level protocol called http (hypertext transport protocol) and an associated programming language html (hypertext markup language) to permit the linking of diverse file types—text, still pictures, movies, sounds, etc. —in a simple way.

"when scientists at CERN...—in a simple way." 补充说明 1989，我们翻译时可以把这个长句分成几个短句："这个状况在 1989 年被彻底改变：日内瓦的欧洲粒子物理研究所的科学家们基于 TCP/IP 协议，使用一种新的被称为 http（WWW 服务程序所用的协议）的高层协议，加上相应的程序设计语言 html（超文本链接标示语言），使各种文件类型——文本、静止的图像、电影、声音等，都可以简单地传输。"

Fill in the blanks according to the information given in the passage.

1. The microprocessor serves as the computer's CPU and is responsible for [1], decoding, and executing [2].
2. The role of the computer's main or primary memory M is to [3] programs and data as they are being processed by the [4].