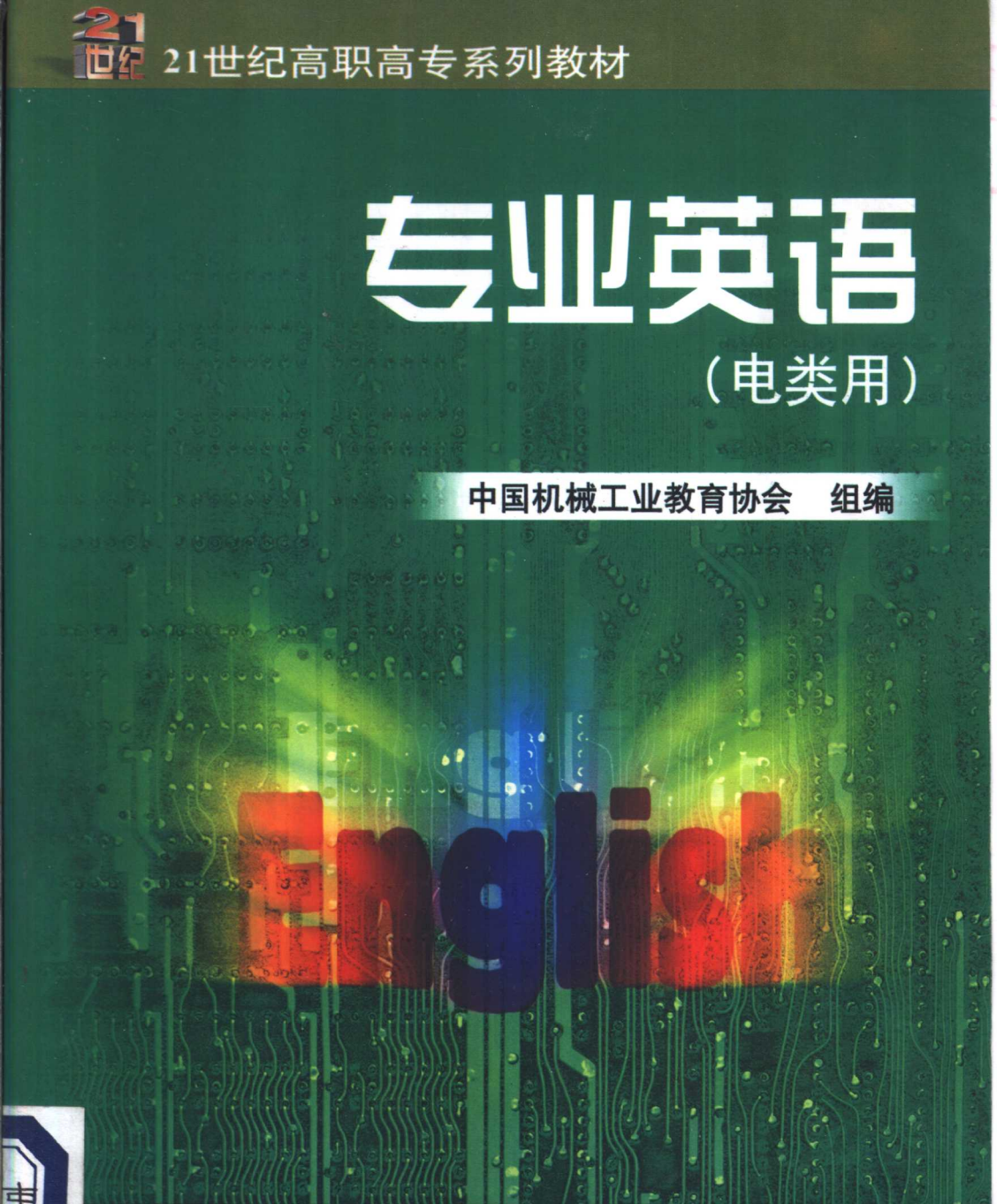
21世纪高职高专系列教材

专业英语

（电类用）

中国机械工业教育协会　组编



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中国机械工业教育协会　组编

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机 械 工 业 出 版 社

本书是根据高等职业技术教学要求编写的。全书共分四大部分，内容包括：计算机及网络、能源、电子技术和电气与控制等。本书取材力求应用面广、语言丰富，集知识性、趣味性为一体，以期达到借助于本书的学习，顺利过渡到阅读英文专业书刊的目的。

本书可作为高等职业技术院校、高等学校专科、职工大学、业余大学、夜大学、函授大学、成人教育学院等大专层次的电类专业英语课程的教材，也可作为广大自学者及工程技术人员的自学用书。

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序

1999 年 6 月中共中央国务院召开第三次全国教育工作会议，作出了“关于深化教育改革，全面推进素质教育的决定”的重大决策，强调教育在综合国力的形成中处于基础地位，坚持实施科教兴国的战略。决定中明确提出要大力发展高等职业教育，培养一大批具有必备的理论知识和较强的实践能力，适应生产、建设、管理、服务第一线急需的高等技术应用性专门人才。为此，教育部召开了关于加强高职高专教学工作会议，进一步明确了高职高专是以培养技术应用性专门人才为根本任务；以适应社会需要为目标；以培养技术应用能力为主线设计学生的知识、能力、素质结构和培养方案；以“应用”为主旨和特征来构建课程和教学内容体系；高职高专的专业设置要体现地区、行业经济和社会发展的需要，即用人的需求；教材可以“一纲多本”，形成有特色的高职高专教材系列。

“教书育人，教材先行”，教育离不开教材。为了贯彻中共中央国务院以及教育部关于高职高专人才培养目标及教材建设的总体要求，中国机械工业教育协会、机械工业出版社组织全国部分有高职高专教学经验的职业技术学院、普通高等学校编写了这套《21 世纪高职高专系列教材》。教材首批 80 余本（书目附书后）已陆续出版发行。

本套教材是根据高中毕业 3 年制（总学时 1 600～1 800）、兼顾 2 年制（总学时 1 100～1 200）的高职高专教学计划需要编写的。在内容上突出了基础理论知识的应用和实践能力的培养。基础理论课以应用为目的，以必需、够用为度，以讲清概念、强化应用为重点；专业课加强了针对性和实用性，强化了实践教学。为了扩大使用面，在内容的取舍上也考虑到电大、职大、业大、函大等教育的教学、自学需要。

每类专业的教材在内容安排和体系上是有机联系、相互衔接的，但每本教材又有各自的独立性。因此各地区院校可根据自己的教学特点进行选择使用。

为了提高质量，真正编写出有显著特色的21世纪高职高专系列教材，组织编写队伍时，采取专门办高职的院校与办高职的普通高等院校相互协作编写并交叉审稿，以便实践教学和理论教学能相互渗透。

机械工业出版社是我国成立最早、规模最大的科技出版社之一，在教材编辑出版方面有雄厚的实力和丰富的经验，出版了一大批适用于全国研究生、大学本科、专科、中专、职工培训等各种层次的成套系列教材，在国内享有很高的声誉。我们相信这套教材也一定能成为具有我国特色的、适合21世纪高职高专教育特点的系列教材。

中国机械工业教育协会

前 言

本书取材于美、英等技术刊物以及因特网上的一些综述性文章。这些文章集知识性、趣味性为一体，使学生在学习专业英语的同时，掌握和了解该领域当前技术发展的最新动态和最新成果，拓宽知识面、更新知识结构。本书不仅可以作为高职高专电类专业学生的专业英语教材，也适用于同专业的本科学生。

全书共分计算机及网络、能源、电子技术和电气与控制四个部分。

计算机及网络部分包括网络技术、电子商务、防火墙技术、在线翻译、Windows 2000、Protel 99、Linux 源代码的开放、CPU 市场、未来的工作和生活方式以及未来的交通和教育等内容。

能源部分介绍了核能、太阳能、地热能、海洋热能、风能、生物能等能源发电的基本原理、发展历史、利用现状和前景以及发电装置设计上的要点、环境保护与常规能源及其发电方式的相互影响等。

电子技术部分包括复合管和集成电路的发明、电子技术对信息技术的影响、硬件描述语言及其用于设计复杂电路时的步骤和过程等。

电气与控制部分包括电力系统运行的一些基本原理、电能质量、燃料电池、电动汽车、数字信号处理在控制中的应用、人工智能等知识。

为了便于学生学习理解，提高阅读翻译能力，每篇课文后面列出了部分生词及词组，对课文背景、词汇、难句等有较详细的注释，并配有 10 道思考题供学生练习之用。

由于水平有限，时间仓促，错误与不妥之处在所难免，望广大读者不吝指正。

编　者

目　　录

Part 1 Computer and Network

Unit 1 Bring Home the Internet

Could this be the future of phone or cable service to your home? Your son **downloads** a 2 Mb file for his college report in just 26 seconds from an Internet Web site. Your daughter passes on some chat to her best friend over the phone. Your wife watches the stock on a television set in the kitchen. You fax a report to a client, while your youngest child is upstairs watching her favorite program on another TV. Oh, yes, and all of the information streams entering and leaving your home-voice call, high-speed Internet data, low-speed data like faxes and stock price, and both analog and digital TV do so over a single "pipe". It will be a few twisted wire pairs, a **coaxial** cable, or a wireless link.

The question of who will supply that pipe could lead to some of the toughest fights the communication marketplace has ever seen. That **all-purpose** pipe could come from a telephone company central office or from the head-end of a local cable-TV operator, or those services could be offered over a wireless link or a communications satellite [1].

Even the local electric utility might jump into the fray. It owns a **right-of-way** for bringing its wires into homes, and there is nothing to prevent it from bringing in optical-fiber cable [2] too.

Ordinary modems, even V.90 devices rated at 56.6 Kb/s, are not sufficient for today's data communication needs. Their **downlink** and **uplink** data transfer rates are simply too low. This **frustrates** users who want to download the large text, image, and audio files available at many Web sites.

Nor do integrated services digital network (ISDN [3]) lines running at 128 Kb/s seem to have much of a future. Service providers are moving to the 1.5~10 MHz speeds that are possible only with other technologies: cable modem, asymmetric digital subscriber lines, or direct satellite broadcasts.

In the good old days, the local telephone company (telco) provided the

only two-way communications link for a residence. However, the growth of the Internet has changed that tradition. Today, a local-exchange carrier can compete in the **turf** of the local telco. In addition, cable TV operators are allowed to offer telephony and Internet access services to their **subscribers** along with TV programs.

ADSL: making gold out of copper

Asymmetric digital subscriber loop (ADSL [4]) offers asymmetric rates of transfer of data to and from the Internet. The uplink rates can go up to 768 Kb/s and downlink rates are 6~8 Mb/s, that depending on the length and condition of local loop—the wiring between the customer's houses and the telco central office.

In addition to fast Internet access, the technology accommodates ordinary analog telephone calls over the same wires. The lone-sharing technique is a sophisticated form of old-fashioned frequency division multiplexing, with each service (analog voice telephony, uplink data, and downlink data), but exploiting some advanced modulation techniques to overcome the shortcomings of twisted-pair cabling.

An important feature of this technology is that its data communication facility is always on. Gone will be the days when the user had to dial into an Internet service provider (ISP [5]) to check for message. With the newer technology, if a computer is on, it is connected to the Internet. This feature is a **boon** to the people who do on-line stock trading, where just about every second counts [6].

Many of the telcos in the United States have begun offering ADSL services to residential customers. However, buying and installing the equipment is not cheap. The modem itself goes for around $325 to which installation adds about $100. Then, too, the PC must have a network interface card.

The charm of cable modems

Even before the 1996, cable TV operators were getting ready to offer high speed Internet connections to homes. Access to the Internet was unregulated. Later cable companies have had a further to offer additional services to

their clients so long as they are certified to do so by the FCC[7] and state utility commissions.

Cable companies bring analog TV signals over optical to their neighborhood distribution points, or head-ends, whence the signals are distributes to residences by coaxial cable, which can carry high-speed data as well as TV signals, is known as hybrid fiber coaxial. Each distribution point typically serves 200~500 residences. Really, cable modems are capable of passing data upstream at speed of 200 Kb/s to 2 Mb/s, and downstream at speeds up to about 10 Mb/s.

Traditional cable TV is a one-way operation: the operator broadcasts programs to its customers, however, interacting with the Internet is a **bi-directional** activity, so providing such service requires changes to the cable distribution plant. One-way amplifiers throughout the cable system must be replaced by two-way units, it is estimated that this will cost incumbent cable TV operators some US $400~$600 per customer, while start-ups may have to invest two or three times as much money.

Cable modems, though capable of operating at higher speeds than ADSL, have some serious drawbacks. To begin with, the cable link to a residence is shared among many users, so that if many of them decide to **log on** the Internet at the same time, achievable speeds may drop. Because the lines are shares, a **hacker**[8] may be able to **eavesdrop** on a neighbor's connection to the Internet or on an **Intranet**—a security problem that may be serious to some users. Lastly, cable modem access is currently not portable. Consequently, a customer who happens to be a road **warrior** will be unable get access into the Internet at airports or hotels through his laptop computer[9].

Wireless: it is not just cellular

The most valuable benefit of wireless services is that they make access possible for people who are on the move. They are also attractive in certain cases where the user is stationary.

Digital **cellular** telephones are quickly becoming the main communications tool for people on the move. But, while they are good for **retrieving**

E-mail and checking stock quotes, the present state of technology does not permit multimedia communication.

Multimedia wireless communications are available, but at present, only to stationary users. Satellite broadcasts, for example, allow fast downlink of Internet contents with a return path over a dial-up modem. The system uses a 530 mm **elliptical** dish antenna aimed at a **geostationary** satellite[10] located above the equator. It should be ideal for rural populations, which are outside the service areas of most cable TV operators and local telcos. The wireless downlink data rate can reach 400 Kb/s. The upstream requests can be sent through dial-up modems or ISDN lines. For family users, the rates are 100 free hours at $49.95 a month and additional hours at $1.95 per hour.

Looking to the future, little is certain except that the Internet is here to stay. But what will happen to the Internet **backbone** when and if the majority of Internet users decide to go the cable modem or ADSL way or wireless links. Will the backbone be able to support the increased traffic?

NEW WORDS

download /daun'loud/ v. 下载，下传
coaxial /kou'æksiəl/ adj. 同轴的，共轴的
all-purpose adj. 通用的，多用途的
right-of-way n. 通行权（公用道路）
downlink /daunliŋk/ v. 下行，向下链接
uplink /ʌpliŋk/ v. [电信]向上传输，上行
frustrate /'frʌstreit/ v. 挫败，使感到灰心
turf /tə:f/ n. 地盘，草根土，草皮；vt. 覆草皮
subscriber /səb'skraibə/ n. 订户，签署者，捐献者
boon /bu:n/ n. 恩惠，实惠，福利
bi-directional /bai-di'rekʃənəl/ n. 双向的
log on 登录，注册，进入系统
hacker /hækə/ n. 电脑黑客

eavesdrop /'i:vzdrɔp/ v. 偷听；n. 屋檐水
Intranet /intrə'net/ n. 企业内部互联网
warrior /'wɔ:riər/ n. 战士，勇士，武士
cellular /'seljulə/ adj. 蜂窝状的，网眼的，细胞的
retrieve /ri'tri:v/ v. 重新得到；n. 找回
elliptical /i'liptikəl/ adj. 椭圆的，省略的
geostationary /ˌdʒi:ou'steiʃənəri/ adj. 与地球相对位置不变的
backbone /'bækboun/ n. 脊椎，中枢，骨干

NOTES

[1] That all-purpose … satellite: 这种多用途的管线可连接至电话公司的中心机房、有线电视的分支，也可以通过无线方式或通信卫星提供这些服务。

[2] optical-fiber cable: 光纤电缆，一种高速大容量通信传输电缆，在长途通信干线上可以代替同轴电缆或金属线，有较强的抗干扰和较高的信噪比，从而保证通信质量。

[3] ISDN: 综合业务数字网，一种高速数字服务网，可极大地提高用户连接 Internet 或公司 LAN 的速度。ISDN 的速度高达 128 Kb/s，其速度比模拟的高速调制解调器快 5 倍多。

[4] ADSL: 不对称数字用户回路。

[5] ISP: 因特网服务提供者，向用户提供因特网访问服务的机构。

[6] every second counts: 每一秒钟都很重要。

[7] FCC: Federal Communications Commission 联邦通信委员会(美)。

[8] hacker: 黑客。原指一些对计算机技术特别感兴趣、有较高知识水平和操作技能、热衷于程序设计和计算机新奇应用的人，后来此词转义为那些凭借自己掌握的计算机技术，专门刺探信息系统中存在的安全漏洞，窥视别人在计算机网络上的秘密，搞恶作剧式的数据破坏，甚至从事更严重的计算机犯罪的人。在因特网术语中，hacker 不一定是贬义语，而把那些从事不良操作的人称为 cracker。

[9] Lastly, cable modem … his laptop computer: 目前，线缆调制解

调器是不可移动的。因此，对于经常出差的用户在机场或饭店就不能通过该方式用自己的膝上电脑访问因特网。

laptop computer: 膝上型计算机。

[10]geostationary satellite: 地球同步通信卫星，静止通信卫星。在地球赤道上空35800公里处、与地球自转同方向的圆形轨道中运行的人造卫星。三颗这种卫星便可覆盖地球表面95%以上地区的通信。

QUESTIONS

(1) Please list the methods of linking home to Internet.

(2) What is the difference between ISDN and ADSL?

(3) What is ADSL? How fast does it transfer data?

(4) Why is it not safe of using the cable modem?

(5) Please describe the operation of wireless communication system.

(6) V.90 modems rated at _____ Kb/s are not sufficient for today's data communication needs.

A. 33.6 B. 128 C. 56.6 D. 56

(7) The high speed transmission pipe could come from many places except _____.

A. a telephone company central office

B. a local cable-TV operator

C. a commercial bank

D. a supply power center

(8) From this article, we know _____ is a fast transmission method.

A. ADSL B. ATM

C. cable modem D. wireless link

(9) If a computer is connected to the Internet by wireless 120 hours a month, the fee is about _____.

A. $50 B. $100 C. $80 D. $90

(10) From this article, we know _____ has a security problem that may be serious to some users.

A. ADSL B. ISDN

C. cable modem D. wireless link

Unit 2 Digital Signature Guide

In today's commercial environment, establishing a **framework** for the **authentication** of computer-based information requires a **familiarity** with concepts and professional skills from both the legal and computer security fields [1]. Combining these two disciplines is not an easy task. Concepts from the information security field often **correspond** only loosely to concepts from the legal field, even in situations where the **terminology** is similar. For example, from the information security of view, digital signature [2] means the result of applying to specific information certain specific technical processes. The legal concept of "signature" is broader. It recognizes any mark made with the intention of authenticating document.

From an information security viewpoint, these simple electronic signatures are **distinct** from the digital signatures described in this guide and in the technical literature, although digital signature is sometimes used to mean any form of computer-based signature. These guidelines use "digital signature" only as it is used in information security terminology, as meaning the result of applying the technical processes described in this guide.

Digital signatures are created and verified by **cryptography**, the branch of applied mathematics that concerns itself with transforming messages into seemingly **unintelligible** forms and back again. Digital signatures use public key cryptography, which employs an **algorithm** using two different but mathematically related "keys"; one for creating a digital signature or transforming data into a seemingly unintelligible form, and another key for verifying a digital signature or returning the message to its original form [3]. Computer equipment and software utilizing two such keys are often collectively termed an "asymmetric cryptography system".

The keys of an asymmetric cryptography system for digital signatures are **arbitrarily** termed the private key, which is known only to the signer and