■ 大学英语应用提高阶段专业英语系列教材

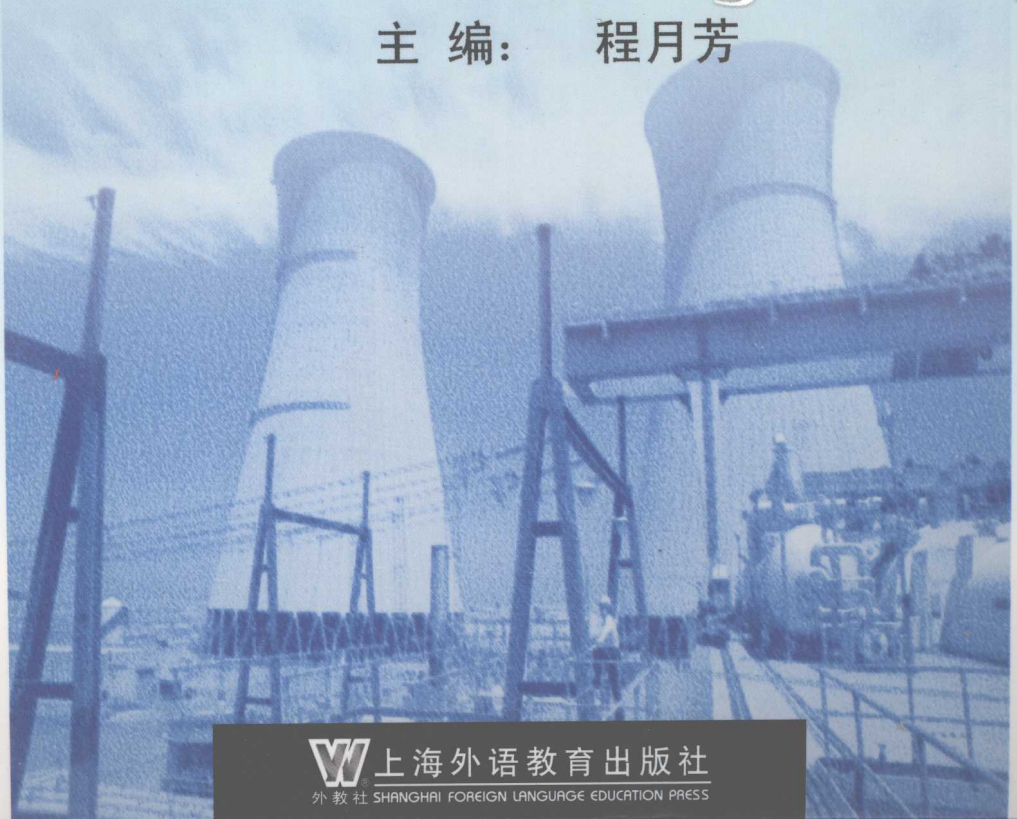
新世纪理工科英语教程

总主编：程月芳　顾问：Geoff Thompson（英国）

动力工程（学生用书）

Power Engineering

主 编：　程月芳



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前　言

大学英语教学大纲(修订本)规定大学英语教学分为基础阶段(一至二年级)和应用提高阶段(三至四年级)。应用提高阶段的教学包括专业英语(Subject-Based English,简称SBE)和高级英语(Advanced English,简称AE)两部分。大纲明确指出:"大学英语教学的目的是培养学生具有较强的阅读能力和一定的听、说、写、译能力,使他们能用英语交流信息。……以适应社会发展和经济建设的需要。"新世纪对人才在外语方面提出了更高的要求。抓好大学英语应用提高阶段的教学已势在必行。编写本教材的目的是帮助理工科学生在应用提高阶段进一步发展、巩固和提高基础阶段已掌握的读、听、写、说、译五种技能,并使部分有一定口语基础的学生在听说能力方面也能有较大的提高,以适应21世纪对高级人才的需求。

本教材主要适用于已完成基础阶段学习的高等学校理工科本科生,为应用提高阶段的必修课和选修课教材,也可用作研究生教学或工程技术人员的外语培训教材。

全套教材由专业教师和英语教师合作编写而成。它以英国语言学家H. G. Widdowson的交际法理论为依据,着重解决语言运用能力的培养问题,使学生将基础阶段已掌握的英语语言知识和技能在自己的专业领域中得到进一步实践和应用,从而达到能以英语为工具获取和交流信息的教学目的。

全套教材由以下十个分册组成:

1. *Mechanical Engineering*(《机械工程》),吉林工业大学编写。
2. *Electrical and Electronic Engineering*(《电气与电子工程》),燕山大学编写。
3. *Computer Engineering*(《计算机工程》),南开大学编写。
4. *Materials Science and Engineering*(《材料科学与工程》),天津大学编写。
5. *Civil Engineering and Architecture*(《土木工程与建筑》),大连理工大学编写。
6. *Chemistry and Chemical Engineering*(《化学和化工》),华东理工大学编写。
7. *Power Engineering*(《动力工程》),上海理工大学编写。
8. *Business Administration*(《工商管理》),湖南大学编写。
9. *Engineering Talk*(《工程师会话》),上海理工大学编写。
10. *Practical Writing and Translation Guidance*(《写作与翻译指导》),燕山大学和华东理工大学编写。

其中一至八分册为专业英语(SBE)必修课教材,旨在使学生通过有关专业题材文章的阅读和训练,不仅能提高英语水平,而且还能学到一定的专业知识,了解一些该专业的信息动态,熟悉和了解专业题材文章的语言特点,掌握一定量的专业词汇。在教材的练习编写上

力求做到新颖多样且实用，并在信息转换和语言表达方式转换能力的训练上下功夫。学生可以通过各种练习在读、听、写、说、译诸方面得到锻炼。实用文写作训练更应注重实用，旨在提高学生的书面表达能力，并向学生提供信函、实验报告、摘要、论文等实用文的表达模式和实例，以便他们在实际使用时作参考。八个分册写作部分原则上相同。

第九分册《工程师会话》作应用提高阶段高级英语(AE)选修课教材，旨在使一些学有余力且在会话方面较有培养前途的学生在口头交际能力上得到训练和提高。选材力求实用，尽量提供一些工程技术人员在实际工作中会遇到的题材，以使他们参加工作后能较快地适应英语口头交际的需要。

第十分册《写作与翻译指导》为教学辅导材料，供教师和学生在教学和学习中作参考。

全套理工科教程由吉林工业大学、大连理工大学、燕山大学、南开大学、天津大学、华东理工大学、上海理工大学、湖南大学合作编写。上海理工大学程月芳教授担任总主编。英国利物浦大学英语语言文学系专家 Mr. Geoff Thompson 担任顾问并协助审校。Mr. Geoff Thompson 和上海交通大学杨惠中教授对教材编写提出了许多宝贵意见。在教材编写的全过程中，上海外语教育出版社社长庄智象教授和编辑室陈鑫源主任给予了大力的支持和帮助，特此表示衷心的感谢。

本书为 *Power Engineering* 分册。由上海理工大学程月芳教授担任主编，张敏波副教授和钟之英(上海交通大学)教授任副主编，施屹立、郑大湖老师和丁国声(燕山大学)教授为编者，东华大学周仲安教授为主审。其中程月芳教授负责全面组织把关和实用文写作中部分内容的编写，张敏波副教授负责统稿、词汇表汇总和 U.1－U.6 及 U.13 的练习编写，钟之英教授负责材料的收集、翻译和部分译文的审校及有关动力工程方面的技术把关，施屹立老师编写 U.7－U.12 的练习，郑大湖老师编写 U.14－U.20 的练习。实用文写作总体由燕山大学丁国声教授统一编写。上海理工大学外语学院硕士生于彩娜、朱凌洁、夏文静、徐之兵和汪凯琼参加了部分课文的翻译工作，动力学院博士生苏海林为实用文写作提供了许多有用资料。

教材中若有不妥之处，望广大使用者提出宝贵意见。

新世纪理工科英语教程编委暨
编　者
2001 年 12 月

使用说明

本书为 *Power Engineering* 分册，供动力工程及相关专业的大学本科学生用做专业英语(Subject-Based English，简称 SBE)即大学第五、六学期的教材，约需 68 学时。

本书分 Text(课文)、Practical Writing(实用文写作)和 Glossary(生词表)3 部分。Text(书中不注明)分 20 个单元，每个单元由 Reading and Comprehension、Reading and Practice 和 Reading and Translation 3 部分组成。全书材料选自国外原版教材、文选、论著、会议论文、实用文件、报刊杂志等。内容涉及动力工程各相关专业的基本物理概念、基础工程知识、发展简史或重大发明创造、人物传记、重要组织机构简介以及发展动向。

Reading and Comprehension 部分旨在培养学生对科技题材文章的阅读理解能力。它由一篇 1 000～1 500 词的阅读文章和若干练习组成。选材注重科学性、可读性、知识性、趣味性和实用性。文章之后附有生词表，将大纲四级词表之外的词汇和专业术语按出现先后次序列出。对一些较复杂的事项或专用词作了注释，以 Notes 的形式附在文章之后。通过练习要求学生掌握文章的中心思想和要点，并就文章内容进行预测、分析、推理、判断和综合概括以及分析篇章结构等。

Reading and Practice 部分由一篇 1 000～1 500 词的阅读文章和 Exercise A、B、C、D 组成，旨在为学生提供运用语言的实践机会。选材偏重专业基础知识。练习按阅读材料的内容设计。文章之后附有生词表，列表方式与前一部分相同。Exercise A、B 偏重学生的语言能力训练。Exercise C 为听力练习，旨在训练学生的听说能力。学生在听完一篇 150～200 词的短文后须回答问题，复述文章内容，或进行 Dictation、Spot Dictation 或 Compound Dictation 等练习。Exercise D 是重点，着重训练学生运用已掌握的语言知识和技能较准确地表达与专业有关的思想和概念的能力。该部分除围绕科技文章中经常出现的语言现象(如定义、分类、描述、指令、论证、概括、举例、逻辑关系表达、计量与计算、数据表达与理解等功能意念或语言现象)进行操练外，还包括参阅技能、通篇浏览、查找信息等学习技能的培养。练习设计将读、听、写、说四种技能的训练相互交融，以提高学生的综合运用能力。

Reading and Translation 部分是为训练学生的翻译能力而设计的。A 为汉译英练习，以句子水平的翻译为主，逐步过渡到段落和篇章水平。B 为英译汉练习。有一篇约 1 000 词的文章，要求学生将划线部分译成汉语。翻译中学生不仅要注意句子的译法，而且还须注意前后文对译文的影响。

Practical Writing 部分除写作指导和练习外，还向学生提供信函、实验报告、摘要、论文等应用文的表达模式，供他们在实际使用时作参考。该部分集中编于书后，自成体系，便于学生参考使用。教师应选用相应章节对学生进行训练。该部分的注释、常用表达方式、练习

答案和补充范例请参阅第十分册《写作与翻译指导》。

Glossary 将生词表中出现的所有单词按字母顺序排列，并注明词性、词义和所在单元，便于学生复习和查找。

本书阅读总量约 100 000 词，总生词量为 1 000。讲课时教师应注重读、听、写、说、译综合技能的训练和交际能力的培养。学生宜在课前做好预习工作。由于阅读量和练习量较大，教师可按学生的实际情况对教材进行有选择的使用。

Contents

UNIT ONE

Reading and Comprehension

Oil and Water — Drilling in the Gulf (I)

We fly out of Venice, Louisiana, with its flood-plain levees, low-lying cow pastures, and oil-patch heliports. Our Bell 412 helicopter, a buffed-up version of a Huey, quickly passes over shredding islands of brown spartina, or salt hay, cross-hatched with canals and studded with oil tank transfer stations.

We cross the southwest channel of the Mississippi and a surf line the color of chocolate mousse. As we fly beyond the first cluster of oil platforms, the water turns a strange jade green. Soon we're some 50 miles off shore in deep blue water. Everywhere on the horizon are oil platforms. There are 4,000 of these structures in the Gulf of Mexico today.

We circle a flat-topped platform called Pompano. Owned by BP, it's the second tallest bottom-fixed structure in the world, drilling into the floor 1,310 feet below the surface.

While President Bush's talk of an energy crisis and plans for increased production of fossil fuels have sparked controversy, few on either side of the debate have paid much attention to the technologically driven boom in the deep water of the Gulf.

Today, offshore drilling accounts for 26 percent of U.S. oil and natural gas production. And despite talk of drilling in the Arctic National Wildlife Refuge and in waters off the West Coast, Florida, and North Carolina, 93 percent of offshore production continues to take place in the Gulf. In the early 1990s, there were reports that the Gulf might be a "Dead Sea," tapped out after 50 years of exploitation, but that was before deep-water drilling technology took off, increasing Gulf oil production by 50 percent in the past five years alone. Today, 52 percent of the oil and 20 percent of the natural gas extracted from the Gulf comes from wells drilled in water depths of 1,000 feet or greater.

Drilling is rapidly moving toward depths of 10,000 feet or more, with Unocal recently sinking a well in 9,743 feet of water. That's too deep for a bottom-fixed platform, but oil companies are extending their reach with new technologies such as cable-

stayed and water-filled platforms, and proposals to replace oil rigs with production ships moored to the seafloor.

About 700 feet wide at its base, Pompano is taller than the Empire State Building. We land on the helideck 12 stories above the water. Even with the copter's rotor stopped, the sea winds continue to whip against us at 30 knots. We climb down two levels past some rigid enclosed lifeboats to the living quarters, walking on cookie-cutter grating that lets you see all the way down to the swells breaking against the platform's legs.

Entering the crew structure, we pass a three-button emergency panel marked "Abandon Platform, Fire, and General Quarters." The galley with its cafeteria-style service, metal tables, bug juice dispenser, video player, and thick couches grouped around the oversized TV reminds me of a number of work boats I've been on, minus the sense of ocean movement.

"It's just like an aircraft carrier in that the platform has to be completely self-sufficient," Hugh Depland, BP's public relations guy, tells me.

Normally operated by a crew of 12 (who work seven days on, seven off), Pompano is crowded with 22 extra men who are reconfiguring the platform for the return visit of a drilling rig. After five years of operation, Pompano's production has declined from about 68,000 barrels of oil a day to around 46,000 barrels (and 63 million cubic feet of natural gas). Not bad, at over a million dollars' worth of product every 24 hours, but Pompano can do better, and will. The oil companies are now able to find oil-and-gas-laden sands they once missed — using 3-D seismic imaging and computer-controlled bottom sensors. And for older platforms like Pompano, the companies use what they call 4-D seismic studies, incorporating past production patterns into their computer analysis of where additional hydrocarbons might be found.

Down in the MCC, the highly automated Multi-Control Center, I meet George Yount, the operations supervisor. He's wearing a tan Carhartt work coat and BP hard hat and looks like a "beach master" elephant seal, thick throated, well padded but strong, with a scraggly mustache and three-day growth of beard. He's been in the industry 25 years.

Also working here is Wendy Lemoine, a thin, blond assistant engineer. While the oil patch has been racially integrated for some time, it's well behind the times when it comes to women. Wendy is the only female among some 80 men on the two platforms I'll visit out here, a fairly typical ratio. A chemical engineer on temporary duty, she says that while she doesn't mind the work, she's definitely looking forward to getting back to Houston where she's based.

After making sure I have a hard hat and ear plugs, George takes me down to the well bay to see the Christmas trees (well pipes). On the way I look over the side and spot about 200 good-size fish schooling around one of the yellow platform legs. A little further out, the torpedo-shaped bodies and yellow tails of a pair of dolphin fish (mahi mahi) streak by. Later in the day we'll spot a big manta ray cruising the area, its 9-foot wings clearing the water like sails. While platforms haven't been shown to increase fish productivity, they do tend to concentrate fish, as do any structures in the ocean, be they coral reefs, shipwrecks, or simply barrels of waste.

The Christmas trees are 23 vertical well pipes (plus two water reinjection pipes) married to small chokes and connectors so the oil can be separated (through "heater/treater" processors) and the gas dewatered before being pumped into big 12-inch pipes running to "the beach." George turns a small caffe latte-type spigot to show me the raw crude, a light-colored mix of oil, water, and gas that he lets run over his fingers. BP, which used to dump its processed water over the side, now reinjects it into the wells to keep the head pressure up. During the 24 hours before I arrived, Pompano produced 46,641 barrels of oil, 63,887,000 cubic feet of gas, and 15,692 barrels of sub-seabed water.

Along with wells drilled from the platform, Pompano also has a "tie-back" pipeline to eight sub-sea oil wells in 1,850 feet of water, 4½ miles away, that were drilled and installed by ship. A new platform under construction will have a 30-mile sub-sea tieback. These tendril-like tiebacks represent a new trend toward remotely controlled operations, with much of the work of surface platforms (like separating the oil, gas, and water) now taking place on the seafloor.

Having shown me the drill deck (living quarters) and production deck, which also houses the electric generators (the platform operates on 3.2 megawatts of power), George takes me down to the sub-cellar where the fire pumps, hydraulics, and utility equipment are located. Here I get to check out the large gray pipes that drop to the seabed before carrying the oil and gas ashore. The bottom of the Gulf is spider-webbed with 33,000 miles of pipes like these, along with underwater well heads and production complexes.

A platform like Pompano costs around $350 million to build and operate, Depland tells me. On the horizon we can see an even more expensive platform: Chevron's $750 million Genesis Spar, which is supported by water ballast and mooring lines, and operates in 2,600 feet of water.

That evening we eat a tasty dinner, including jambalaya, crawfish etouffee, corn bread, French fries, and ice cream. Rig dining may not be heart-healthy but at least none of the crew out here appear to be under-nourished. Later we go to sleep in double-

stacked steel shipping containers converted to crew quarters.

The next day, we take the 15-mile helo-hop from Pompano over to Amberjack. Rigs, I discover, are named after their lease sales, which, for security reasons, are given theme-based designations by the oil companies' secretive exploration departments. That way, if some drunk is overheard in a Houston bar mentioning how many millions his company bid on Bullwinkle, it won't mean anything to an eavesdropper. Lease sale themes have included rock bands, country-and-western singers, types of booze, game fish, and, as with Bullwinkle, even cartoon characters.

Amberjack is the ultimate Tinkertoy. An active drilling rig, it towers 272 feet from the waterline to the top of its bottle-shaped derrick. With a four-story metal crew building, helipad, flare-off tower, tanks, processors, compressors, drill deck with 8,300 feet of piping stacked 12 feet high, 1,000 barrels of drilling mud, mud shakers, cement, two big yellow cranes, an office shack, lifeboats, and hundreds of other pipes, tubes, racks, gears, lines, and computerized systems hanging out over both ends of its legs on thick steel shelves. Amberjack is a structural salute to human ingenuity. You know whoever designed this thing doesn't waste closet space at home. Still, from the air Amberjack looks small and somewhat fragile set against the whitecapped expanse of the Gulf's blue waters.

(From *Popular Science*, Vol. 259, No.2, 2001)

Words and Expressions

levee / ˈlevɪ /	*n.*	堤;码头
buffed-up / ˈbʌftʌp /	*a.*	用软皮擦亮的;淡黄色的;抛光的
shred / ʃred /	*v.*	撕碎,切碎
spartina / ˈspɑːtɪnə /	*n.*	锌土
cross-hatched / ˈkrɒsˈhætʃɪt /	*a.*	用交叉线画成阴影的
stud / stʌd /	*v.*	密布;点缀
surf / sɜːf /	*n.*	拍岸浪
mousse / muːs /	*n.*	奶油冻;摩丝
jade / dʒeɪd /	*n.*	玉;翡翠
rig / rɪg /	*n.*	[矿]钻塔,钻车;用具
	v.	装配
moor / mʊə /	*v.*	(使)停泊,系泊;使固定