“十三五”职业教育国家规划教材

新编高等职业教育电子信息、机电类精品教材

机械专业交际英语（第3版）

Communicative English for Mechanical Purposes（Third Edition）

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内 容 简 介

本书基于机械类专业工作岗位对英语能力的需求，立足“能力本位”，以交际性为特色，突出专业英语的听、说、口语表达能力和专业应用文写作能力的训练，并以此为推手促进学生专业英语阅读与翻译能力及学习兴趣的提高。

本书共八个学习情境，是根据机械行业的典型工作情境和职业场景设计的。每个学习情境均从机械工职业就业展开，以普通车床和数控加工中心为主要设备来学习机床的相关操作，追随当今机械制造业的高度自动化和网络化趋势，领略自动化工厂的运行，参加国际机床展览会，开展技术交流与合作，最后以毕业生就业面试结束。本书前后呼应，融会贯通；学习情境的听、说、读、写、译各部分紧扣同一主题展开，任务驱动，行动导向。

本书包含阅读和视、听、说等多媒体教学资源，以提高教学效率。

本书适合作为职业院校、成人高校的机械设计与制造、机械制造与自动化、数控技术、机电设备类专业的教材，也适合从事机械技术或产品营销的社会人员学习使用，是训练机械类专业英语听、说能力的好帮手。

本书为“十三五”职业教育国家规划教材。

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前　言

高职专业英语课程的目标是培养熟练掌握专业英语知识的技能型人才，旨在训练在生产、管理、服务第一线所需的语言交际能力和应对各种涉外局面的语言应用能力。在当今职业教育发展和改革的浪潮下，高职专业英语课程应根据专业工作岗位的实际需要，立足“能力本位”，以综合职业能力培养为目的，工学结合，帮助学生掌握本专业听、说、读、写、译的基本语言技能，实现高职人才的培养目标。

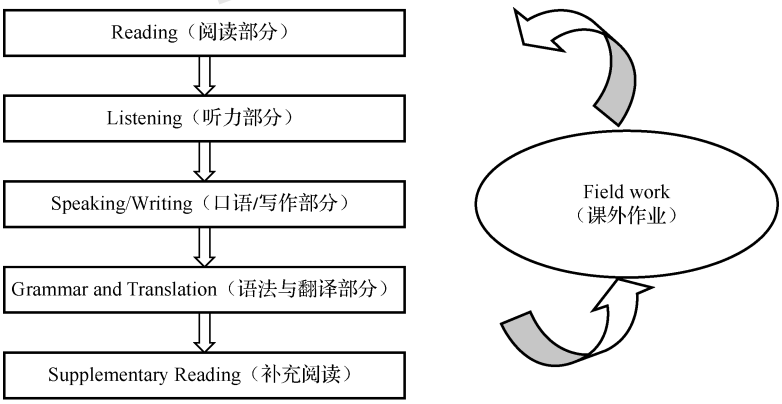
本书顺应潮流，改变了原有专业英语只强调阅读理解和翻译能力培养的教学理念，以交际应用为目的设计学习情境，突出专业英语的听、说、口语表达能力和专业应用文写作能力的训练，并以此为推手促进学生专业英语阅读与翻译能力及学习兴趣的提高。

1．学习情境设计

本书根据机械行业的典型工作情境和职业场景设计了八个学习情境（Learning Situation，LS）。学习情境从机械工职业就业展开，以普通车床和数控加工中心为主要设备来学习机床的相关操作，追随当今机械制造业的高度自动化和网络化趋势，领略自动化工厂的运行，参加国际机床展览会，开展技术交流与合作，最后以毕业生就业面试结束。本书前后呼应，融会贯通。

2．学习情境架构

各学习情境编写框架示意图如下。



学习情境的各部分紧扣同一主题展开，Reading 为后续 Listening 和 Speaking 提供专业背景材料和专业词汇储备，Field work 的完成贯穿整个学习情境。

3．教学理念和方法

本书体现以下教学理念和教学方法。

（1）听说交际。遵循语言教学规律，以岗位需要的听、说、能力训练为抓手展开英语

教学。听力材料的选取围绕学习情境主题，选择原汁原味的英文原声录音。口语任务的设计呈现递进层次，如看图说话→小对话→情境对话。

（2）任务驱动，行动导向。借鉴普通英语教学法设计了丰富的听、说、读、写、译学习任务或趣味游戏活动（如小组竞赛、角色表演、配音比赛等），以专业内容为载体训练学生的英语综合应用能力，使学生成为学习的主体。任务来自岗位工作分析，如实际技术交流中经常会遇到符号或数字的读法问题，因此在学习情境 3 中设计了数字阅读的口语题。

任务形式多样，阅读训练题型达二十种，听力训练主要是根据视听材料完成填空、选择、回答问题等任务，口语训练主要有看图说话、互相提问和回答、情境对话、PPT 汇报、视频配音等，写作训练有英文摘要和英文简历书写，翻译有专业材料的英译中或中译英。

（3）多媒体教学。本书配备多媒体资源，包含课文朗读、生词发音、视听和口语材料，是实现多媒体教学的支撑。

（4）综合职业能力培养。以结对或小组形式开展学习，培养合作能力、表达能力。Reading 部分注重专业能力的培养，而 Listening 和 Speaking 部分则侧重方法能力和社会能力的培养。

（5）语言应用性。本书将英语与专业知识有机融合，学习者既学语言，又学专业知识，用英语表达专业（听、说、写），用英语寻求技术答案（读、译）。

（6）边学边做边说。引入企业员工培训理念，借鉴日本产业训练协会 TWI 工作指导方法（Job Instruction）训练学生口语，如根据课文说明操作机床，边做边说。

（7）遵循英语教学规律。由于英语学习有较多的记忆任务，采用机械式背诵令学生感到乏味；本书对于同一学习要点，采用了多样的任务形式，使学生在反复训练中掌握学习重点。

（8）学习难度。本书与传统的专业英语教材相比，突出了英语的交际特色，而专业性内容则相对浅显，难度大大降低，学生在对专业内容较熟悉的情况下，能够快速获得专业英语应用能力，这也为普通英语师资专业化发展创造了条件。不追求语法的完整性和系统性，只根据专业英语的特点提出学习方法。

4．编写特色

（1）以服务教学为导向。本书体现了较多的教学方法，让教师好教，学生易学。它既不是原版技术书籍的汇编，也不是纯粹的语言类书籍，而是包含语言和专业、体现岗位工作情境、实现教学做一体化、呈现对学习者和指导者的关心、有效实施高职机械类专业英语课程教学的解决方案。

（2）采用工作页。每个任务都留有工作页，供学生自主学习。

（3）表现形式新颖。本书图文并茂，表达直观，易于理解，增加了趣味性。

5．适用范围

本书适合作为职业院校、成人高校的机械设计与制造、机械制造与自动化、数控技术、机电设备类专业的教材，也适合从事机械技术或产品营销的社会人员学习使用，是训练机械类专业英语听、说能力的好帮手。本书建议总学时为 64 学时，可根据实际专业课程设置情况选学。

6．致谢

本书由常州机电职业技术学院汤彩萍老师编著，Maroke Sukhdev Singh 主审。本书在编写过程中得到了常州创胜特尔数控机床设备有限公司赖立迅总工程师、德国博世力士乐公司 Tim Hohlmann 先生和吴宏娟女士的大力帮助，还得到了常州机电职业技术学院许朝山、苌晓兵、于华艳、靳敏、金志国、陶波等老师的热情帮助，美籍语言学硕士 Satina Anziano 女士为本书录制了音频，在此一并表示感谢。

由于作者学识和经验有限，书中难免不妥之处，恳请使用者批评指正！同时，作者为用户提供了电子教案、教学指南、参考答案、视听文字稿等丰富的配套资源，请有需要的教师登录华信教育资源网（www.hxedu.com.cn）免费注册后下载。欢迎各位读者关注微信公众号：机电双语学堂，获取更多专业资讯和知识。作者联系方式为 E-mail:994972327@qq.com，微信号：TIMES_2015。

汤彩萍

Contents

Learning Situation 1

What machinists do

Focus of the situation

This class will discuss the job employment of machinists in the mechanical manufacturing field in terms of work procedures, job safety, and job prospects. [本课从工作内容、工作安全、就业前景等方面讨论机械制造领域机械工的工作与就业。]

Field work

How much do you know about employment opportunities related to the mechanical trade? What are you going to do in the future? Make a PPT and prepare for an in-class presentation.

Part A Reading

Machinists use machine tools, such as lathes, milling machines, and machining centers, to produce precision metal parts[1]. Although they may produce large quantities of one part, precision machinists often produce small batches or one-of-a-kind items. They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations needed to make machined products that meet precise specifications[2].

Before they machine a part, machinists must carefully plan and prepare the operation[3]. These workers first review blueprints or written specifications for a job. Next, they calculate where to cut or bore into the workpiece, how fast to feed the tool into the metal, how much metal to remove. and how to clamp the workpiece They then select tools and materials for the job, plan the sequence of cutting and finishing operations, and mark the metal stock to show where cuts should be made[4].

After this layout work is completed, machinists perform the necessary machining operations. They position the metal stock on the machine tool—drill press, lathe, milling machine, or other type of machine—set the controls, and make the cuts. During the machining process, they must constantly monitor the feed rate and speed of the machine. Machinists also ensure that the workpiece is being properly lubricated and cooled, because the machining of metal products generates a significant amount of heat. The temperature of the workpiece is a key concern because most metals expand when heated; machinists must adjust the size of their cuts relative to the temperature[5]. Some rare but increasingly popular metals, such as titanium, are machined at extremely high temperatures.

Machinists detect some problems by listening for specific sounds—for example, a dull cutting tool or excessive vibration. Dull cutting tools are removed and replaced. Cutting speeds are adjusted to compensate for harmonic vibrations, which can decrease the accuracy of cuts, particularly on newer high-speed spindles and lathes[6]. After the work is completed, machinists use both simple and highly sophisticated measuring tools to check the accuracy of their work against blueprints.

CNC machinists

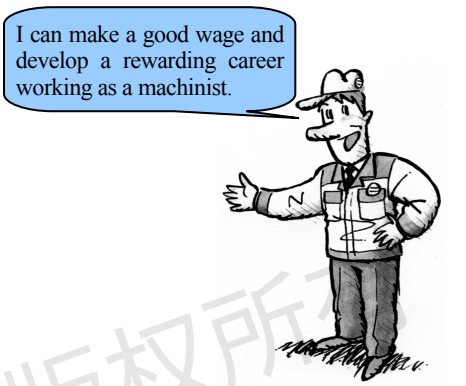
Some machinists, often called production machinists, may produce large quantities of one part, especially parts requiring the use of complex operations and great precision. Many modern machine tools are computer numerically controlled (CNC). Frequently, machinists work with computer-control programmers to determine how the automated equipment will cut a part. The programmer may determine the path of the cut, while the machinist determines the type of the cutting tool, the speed of the cutting tool, and the feed rate. Because most machinists train in CNC programming, they may write basic programs themselves and often modify programs in response to problems encountered during test runs[7]. After the production process is designed, relatively simple and repetitive operations normally are performed by machine setters, operators, and tenders.

Some manufacturing techniques employ automated parts loaders, automatic tool changers, and computer controls, allowing machine tools to operate without anyone present. One production machinist, working 8 hours a day, might monitor equipment, replace worn cutting tools, check the

accuracy of parts being produced, and perform other tasks on several CNC machines that operate 24 hours a day (lights-out manufacturing). During lights-out manufacturing, a factory may need only a few machinists to monitor the entire factory.

Maintenance machinists

Other machinists, often called mechanics, do maintenance work—repairing or making new parts for existing machinery. To repair a broken part, maintenance machinists may refer to blueprints and perform the same machining operations needed to create the original part.



Work safety

Today, most machine shops are relatively clean, well lit, and ventilated. Many computer-controlled machines are partially or totally enclosed, minimizing the exposure of workers to noise, debris, and the lubricants used to cool workpieces during machining. Nevertheless, working around machine tools presents certain dangers, and workers must follow safety precautions. Machinists must wear protective equipment, such as safety glasses to shield against bits of flying metal and earplugs to dampen machinery noise. They also must exercise caution when handling hazardous coolants and lubricants, although many common water-based lubricants present little hazard. The job requires stamina, because machinists stand most of the day and, at times, may need to lift moderately heavy workpieces.

Job opportunities

Job opportunities for machinists should continue to be good, as employers value the wide-ranging skills of these workers. Also, many young people prefer to attend college or may not wish to enter production occupations. Therefore, the number of workers learning to be machinists is expected to be less than the number of job openings arising each year from the need to replace experienced machinists who retire or transfer to other occupations[8].

So don't hesitate any longer, and let's get into the machine shop right now.

TECHNICAL WORDS

machinist	[məˈʃiːnist]	*n.*	机械工，机械师
lathe	[leið]	*n.*	车床
mill	[mil]	*v. & n.*	铣削；铣刀，铣床，工厂
machine	[məˈʃiːn]	*n. & v.*	机器，机械，机床；机加工
precision	[priˈsiʒən]	*n.*	精密，精度
property	[ˈprɔpəti]	*n.*	属性，特性

specification	[ˌspesifiˈkeiʃən]	*n.*	规格
blueprint	[ˈbluːˌprint]	*n.*	图纸，蓝图
job	[dʒɔb]	*n.*	工作（任务），作业
bore	[bɔː]	*v.*	镗孔，钻孔
workpiece	[ˈwəːkpiːs]	*n.*	工件，加工件
feed	[fiːd]	*n. & v.*	进给；切入
stock	[stɔk]	*n.*	毛坯，余量；库存
position	[pəˈziʃən]	*n. & v.*	位置，岗位；定位
drill	[dril]	*v. & n.*	钻削；钻头，钻床
lubricate	[ˈluːbrikeit]	*v.*	润滑
cool	[kuːl]	*v.*	冷却
vibration	[vaiˈbreiʃən]	*n.*	振动
compensate	[ˈkɔmpənseit]	*v.*	补偿
accuracy	[ˈækjurəsi]	*n.*	精度
spindle	[ˈspindl]	*n.*	主轴
modify	[ˈmɔdifai]	*v.*	修改
process	[ˈprəuses]	*n.*	工艺流程
manufacture	[ˌmænjuˈfæktʃə]	*v.*	制造
technique	[tekˈniːk]	*n.*	技术，技巧，方法
employ	[imˈplɔi]	*v.*	雇用，使用
operator	[ˈɔpəreitə]	*n.*	操作员
maintenance	[ˈmeintinəns]	*n.*	维护，保养，维修
machinery	[məˈʃiːnəri]	*n.*	机械，机器（不可数名词）
create	[kriˈeit]	*v.*	创造，创建
mechanic	[miˈkænik]	*n.*	机修工
ventilate	[ˈventileit]	*v.*	通风
lubricant	[ˈluːbrikənt]	*n.*	润滑液（剂）
coolant	[ˈkuːlənt]	*n.*	冷却液

PHRASES

machine tool	机床
milling machine	铣床
machining center	加工中心
small batches or one-of-a-kind items	单件小批量
finishing operation	精加工操作

drill press		台式钻床
feed rate		进给速度
cutting tool		刀具
cutting speed		切削速度
harmonic vibration		谐振
computer numerically controlled	（CNC）	数控
computer-control programmer		数控编程员
test run		试运行
automatic tool changer	（ATC）	自动换刀装置
computer control		计算机数控系统
machine setter		机床调试工
machine tender		机床放料工，辅助工
worn cutting tool		磨损的刀具
lights-out manufacturing		无人值守制造，自动化制造
machine shop		车间
computer-controlled machine		数控机床
safety precaution		安全预防
safety glasses		安全眼镜

NOTES

1. Machinists use **machine tools**, such as lathes, milling machines, and machining centers, to produce precision metal parts. 机械工使用诸如车床、铣床和加工中心等机床来制造精密金属零件。*机床是制造各种机器（machine）的工具，被称为工业母机，因此英语里的“机床”往往用“machine tool”来表达。*

2. They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations **needed** to make **machined** products **that meet precise specifications**. 他们运用其在金属材料特性方面的知识和机床方面的技能进行工艺规划和加工，制造满足精度规格要求的机加工产品。*needed 为过去分词，作为后置定语，修饰 operations，相当于定语从句 that are needed；that meet precise specifications 是定语从句，修饰 products；machined products 中 machined 是过去分词作为定语。*

3. Before they machine a part, machinists must carefully **plan** and **prepare** the operation. 加工零件之前，机械工必须对整个加工过程进行仔细的规划和准备。*plan 和 prepare 采用了词类转译（动词转换成名词），参见 LS6 Part D“省译、增译和转译”。*

4. These workers **first** review blueprints or written specifications for a job. **Next**, they calculate where to cut or bore into the workpiece, how fast to feed the metal into the machine, and how much metal to remove. They **then** select tools and materials for the job, plan the sequence of cutting and finishing operations, and mark the metal stock to show where cuts should be made. 首

先，这些工人阅读作业零件的图纸或书面说明；接下来，他们计算切入或钻入工件的位置、工件的进给速度、金属的去除量；然后，他们选择适合工件的刀具和材料，制定粗加工和精加工操作的顺序，在金属毛坯上标记切削位置。*需要表达工作步骤时，可以用 first… next…then…或 before… after…*

5. The temperature of the workpiece is a key concern because most metals expand **when heated**; machinists must adjust the size of their cuts relative to the temperature. 因为大多数金属受热后会膨胀，所以工件的温度是重点关注的问题；机械工必须基于温度调整切削用量。*when heated 相当于 when they are heated，heated 为过去分词，表示被动。*

6. Cutting speeds are adjusted to compensate for harmonic vibrations, **which can decrease the accuracy of cuts**, particularly on newer high-speed spindles and lathes. 调整切削速度以补偿谐振造成的误差，谐振会降低切削精度，尤其在一些新型的高速主轴和车床上。*which can decrease the accuracy of cuts 是定语从句，修饰 harmonic vibrations。*

7. Because most machinists train in CNC programming, they may write basic programs themselves and often modify programs in response to problems **encountered** during test runs. 由于大多数机械工都接受过数控编程的培训，他们会编写基本的程序，并且经常修改程序以应对试运行过程中碰到的问题。*encountered 为过去分词，作为后置定语，修饰 problems。*

8. Therefore, the number of workers **learning to be machinists** is expected to be less than the number of job openings **arising each year from the need to replace experienced machinists who retire or transfer to other occupations.** 每年都有一些有经验的机械工退休或转到其他职业，由此带来的职位空缺数量预计大于准备从事机械工工作的工人数量。*learning to be machinists 是 workers 的定语，arising each year from the need 是 job openings 的定语，to replace experienced machinists 是 need 的定语，定语从句 who retire or transfer to other occupations 修饰 experienced machinists。这句话结构比较复杂，翻译比较困难，但只要分析语法，就能理解其含义，再译成通顺的汉语。*

PRACTICE

Task 1　Translate the following words or phrases into English.

1．精密零件　　2．加工零件
3．精加工　　4．金属毛坯
5．进给速度　　6．更换刀具
7．维修机械工　　8．符合规格
9．修改程序　　10．遇到问题
11．数控机床　　12．加工中心
13．车床　　14．铣床
15．镗床　　16．钻床
17．强烈的振动　　18．完成功能
19．完成操作　　20．完成任务
21．冷却　　22．润滑

23．高精度　　24．高速主轴

25．切削路径　　26．全防护

27．无人值守制造　　28．数控系统

29．数控编程员　　30．操作工

Task 2　Choose the correct English explanation for each of the following words.

1. Lathe

(A) is a machine that turns a piece of metal round and round against a sharp tool that gives it shape.

(B) is the motion of moving the workpiece and the cutting tool together so as to remove material.

(C) is the operation of enlarging a hole with a single-point tool. This operation produces a close tolerance（公差） and fine（精细的） finish（表面光洁度）.

Your answer: _____

2. Milling machine

(A) is a machine that turns a piece of metal round and round against a sharp tool that gives it shape.

(B) is a machine that removes metal through the use of electrical sparks（电火花）which burn away the metal.

(C) is a machine tool that removes material by rotating a cutter and moving into the material. It is used to produce flat and angular surfaces, grooves（槽）, contours（轮廓）, and gears.

Your answer: _____

3. Boring

(A) is a machine that turns a piece of metal round and round against a sharp tool that gives it shape.

(B) is the process or technique of reducing wear（磨损）between surfaces by using a lubricant between the surfaces.

(C) is the operation of enlarging a hole with a single-point tool. This operation produces a close tolerance and fine finish.

Your answer: _____

4. Feed

(A) is the motion of moving the workpiece and the cutting tool together so as to remove material.

(B) is the process or technique of reducing wear between surfaces by using a lubricant between the surfaces.

(C) is the operation of enlarging a hole with a single-point tool. This operation produces a close tolerance and fine finish.

Your answer: _____

5. CNC

(A) is a special liquid that performs three main functions during machining. It lubricates the

cutting action, carries off the heat generated, and flushes（冲洗）the chips（切屑）.

(B) is a form of programmable automation in which the machine tool is controlled by a program in computer memory.

(C) is the process of removing metal with machine tools such as lathes, mills and a wide variety of other tools.

Your answer: _____

6. Lubrication

(A) is the process or technique of reducing wear between surfaces by using a lubricant between the surfaces.

(B) is a special liquid that performs three main functions during machining. It lubricates the cutting action, carries off the heat generated, and flushes the chips.

(C) is the material being machined. It can be any material and any shape. In the machine shop it usually refers to round or flat pieces of metal ready to be machined.

Your answer:_____

7. Coolant

(A) is the process or technique employed to reduce wear between surfaces by using a lubricant between the surfaces.

(B) is a special liquid that performs three main functions during machining. It lubricates the cutting action, carries off the heat generated, and flushes the chips.

(C) is the material being machined. It can be any material and any shape. In the machine shop it usually refers to round or flat pieces of metal ready to be machined.

Your answer:_____

8. Stock

(A) is the process or technique employed to reduce wear between surfaces by using a lubricant between the surfaces.

(B) is that portion（一部分） of a machine tool that spins（旋转）either the workpiece or the cutting tool and is driven by the motor. On a milling machine, it turns within the quill（套筒）while on a lathe it turns within the headstock（床头箱）.

(C) is the material being machined. It can be any material and any shape. In the machine shop it usually refers to round or flat pieces of metal ready to be machined.

Your answer:_____

9. Spindle

(A) is a special liquid that performs three main functions during machining. It lubricates the cutting action, cools the cutting action, and flushes the chips.

(B) is that portion of a machine tool that spins either the workpiece or the cutting tool and is driven by the motor. On a milling machine it turns within the quill while on a lathe it turns within the headstock.

(C) is the material being machined. It can be any material and any shape. In the machine shop it usually refers to round or flat pieces of metal ready to be machined.

Your answer:_____

10. Machining

(A) is a person who uses machine tools to make or modify parts, primarily metal parts.

(B) is the process of removing metal with machine tools such as lathes, mills and a wide variety of other tools.

(C) is the piece of metal that is being shaped.

Your answer:_____

Task 3 Fill in the brackets with words that have similar meaning to the underlined words, changing their forms if necessary.

1．(　　) Machinists use machine tools, such as lathes, milling machines, and machining centers, to produce precision metal parts.

2．(　　) Machinists use machine tools, such as lathes, milling machines, and machining centers, to produce precision metal parts.

3．(　　) They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations needed to make machined products that meet precise specifications.

4．(　　) One production machinist might monitor equipment, replace worn cutting tools, check the accuracy of parts being produced, and perform other tasks on several CNC machines.

5．(　　) After the work is completed, machinists use both simple and highly sophisticated measuring tools to check the accuracy of their work against blueprints.

6．(　　) Machinists may write basic programs themselves and often modify programs in response to problems encountered during test runs.

7．(　　) Machinists may write basic programs themselves and often modify programs in response to problems encountered during test runs.

8．(　　) Machinists also ensure that the workpiece is being properly lubricated and cooled, because the machining of metal products generates a significant amount of heat.

9．(　　) Some manufacturing techniques employ automated parts loaders, automatic tool changers, and computer controls, allowing machine tools to operate without anyone present.

10．(　　) Other machinists do maintenance work—repairing or making new parts for existing machinery.

11．(　　) The job requires stamina（体力）, because machinists stand most of the day and, at times, may need to lift moderately heavy workpieces.

12．(　　) Machinists must exercise caution when handling hazardous coolants and lubricants, although many common water-based lubricants present little hazard.

13．(　　) Machinists must exercise caution when handling hazardous coolants and lubricants, although many common water-based lubricants present little hazard.

14．(　　) To repair a broken part, maintenance machinists may refer to blueprints and perform the same machining operations needed to create the original part.

15．(　　) During lights-out manufacturing, a factory may need only a few machinists to monitor the entire factory.

16. ( ) They design and carry out the operations needed to make machined products that meet precise specifications.

17. ( ) Machinists use machine tools, such as lathes, milling machines, and machining centers, to produce precision metal parts.

18. ( ) Machinists use both simple and highly sophisticated measuring tools to check the accuracy of their work against blueprints.

19. ( ) The temperature of the workpiece is a key concern because most metals expand when heated; machinists must adjust the size of their cuts relative to the temperature.

20. ( ) These workers first review blueprints or written specifications for a job.

Task 4 The following information relates to what machinists do. Match Column A with Column B.

Column A	Column B
use	feeds and speeds
produce	machine tools
review	the accuracy
calculate	the metal stock
position	blueprints
set	problems
monitor	dull tools
detect	the machining
replace	the controls
check	parts

Task 5 Fill in the blanks with the following words, changing their forms if necessary.

machine setter, CNC, workpiece, lathe, plan, check, perform, accuracy

1. _____ is the piece of metal that is being shaped.

2. _____ refers to a computer "controller" that reads code instructions and drives the machine tool.

3. The working procedures for machinists are: first, they must carefully _____ and prepare the operation; next, they _____ the necessary machining operations; then they _____ the accuracy of their work against blueprints.

4. _____ is a machine that turns a piece of metal round and round against a sharp tool that gives it shape.

5. _____ prepare the machines prior to production, perform initial test runs producing a part, and may adjust and make minor repairs to the machinery during its operation.

6. After the work is completed, machinists use both simple and highly sophisticated measuring tools to check the _____ of their work against blueprints.

Task 6 Choose the best answer.

1. Before they machine a part, the first thing for machinists is:

(A) To review blueprints or written specifications for a job

(B) To calculate where to cut or bore into the workpiece, how fast to feed the metal into the machine, and how much metal to remove

(C) To select tools and materials for the job, plan the sequence of cutting and finishing operations, and mark the metal stock to show where cuts should be made

Your answer:_____

2. The proper sequence of performing the necessary machining operations for machinists is as the following:

① complete layout work
② set the controls
③ position the metal stock on the machine tool
④ monitor the feed rate and speed of the machine
⑤ make the cuts

(A) ①→③→②→⑤→④

(B) ①→②→④→③→⑤

(C) ①→②→③→④→⑤

Your answer: _____

3. Cutting speeds are reduced to compensate for harmonic vibrations, which can_____the accuracy of cuts.

(A) Increase

(B) Decrease

(C) Neither of the above

Your answer: _____

4. Sounds in the machine tool are probably caused by:

(A) A dull cutting tool

(B) High speeds

(C) A dull cutting tool or high speeds

Your answer: _____

5. Who determines the path of the cut?

(A) The machinist. (B) The programmer.

(C) The operator. (D) The machine setter.

Your answer: _____

6. Who determines the type of the cutting tool, the speed of the cutting tool, and the feed rate?

(A) The machinist. (B) The programmer.

(C) The machine tender. (D) The machine setter.

Your answer: _____

7. Whom are relatively simple and repetitive operations normally performed by?

(A) The machinist. (B) The programmer.

(C) The machine operator. (D) The machine maintenance person.

Your answer: _____

8. During lights-out manufacturing,_____.

(A) Works operate the machine tools with the lights off

(B) Machine tools operate without anyone present

(C) A factory needs no workers

Your answer: _____

Task 7 Find the missing words for the following passage and then read it aloud.

Some machinists, often called production _____, may produce large quantities of one _____, especially parts requiring the use of complex _____ and great _____. Many modern machine tools are _____(CNC). Frequently, machinists work with computer-control _____ to determine how the automated equipment will cut a part. The programmer may determine the_____ of the cut, while the machinist determines the _____ of the cutting tool, the _____ of the cutting tool, and the _____. Because most machinists train in CNC _____, they may write basic programs themselves and often modify _____ in response to problems encountered during test runs. After the production _____ is designed, relatively simple and repetitive operations normally are performed by machine setters, operators, and tenders.

Part B Listening

Task 1 Listen to the five statements twice and write them down.

1. .....

2. .....

3. .....

4. .....

5. .....

Task 2 The following video is about machinist job training. Watch it first, then listen to it twice and fill in the blanks with what you hear. Fig. 1-1 shows the Logo of the training center.

This is one of two training centers of Southern California, a great place to become a sought-after （吃香的）(1)_____. Michael Kerwin is the president, "This is a great field to be in." A field which includes grinding, (2)_____, using a (3)_____, and the latest computer-controlled machine tools. The instructors and administrators come right out of the (4)_____. "We were put together by a group of companies and owners of machining companies in this area in

1968 and have been doing training in that area ever since." The training centers with campuses in Norwalk and Ontario are a non-profit arm（部门）of the Los Angeles Chapter of the NTMA. That's the National (5)_____ & (6)_____ Association.

Fig.1-1 Logo of NTMA

Task 3 Watch and listen to the above video once more, and choose the best answer to each of the following questions.

1. How many training centers are there in Southern California?

(A) One. (B) Two. (C) Three.

Your answer: _____

2. The NTMA training centers:

(A) Make a lot of money

(B) Are non-profit organizations

(C) Only train men

Your answer: _____

3. How long is the history of the training center?

(A) More than 20 years. (B) More than 30 years. (C) More than 40 years.

Your answer: _____

4. How long does the basic machining course last?

(A) 700 hours. (B) Seven months. (C) Six weeks.

Your answer: _____

5. What's quite a resume for getting a job of machinists according to what you hear?

(A) Certificate of Entry Level Machinists.

(B) Collection of projects made by the trainees.

(C) A finely made application letter.

Your answer: _____

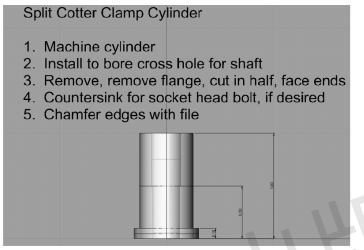
Part C Speaking

Task 1 Watch the slides and give a name or phrase for each of the slides. You may compete by group. Take notes.

1. ..... 6. .....
2. ..... 7. .....
3. ..... 8. .....
4. ..... 9. .....
5. ..... 10. .....

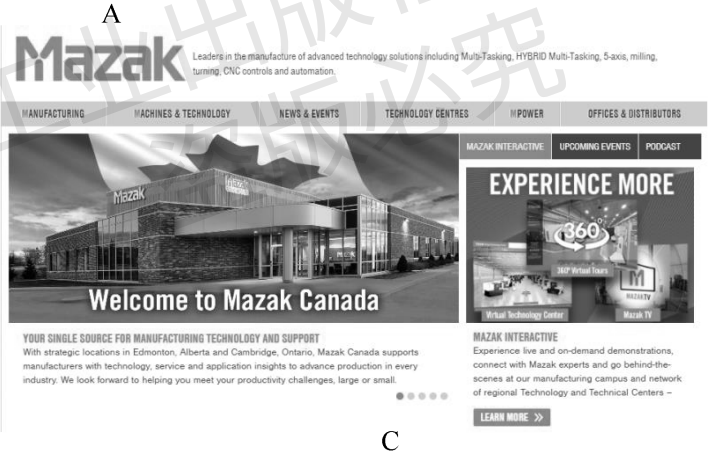
Task 2 ***As a machinist, you may experience the following English-related working situations. Match them with the corresponding pictures shown in Fig.1-2. Then discuss what other possible situations there are where you might have to use English.***

Operate machines with display screens in English	☐
Visit foreign websites for technical information	☐
Read blueprints in English from foreign customers	☐
Follow safety precautions or maintenance practice in English	☐
Look up the machine operator's manual or service manual	☐

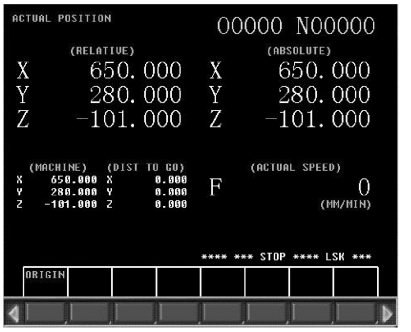


A

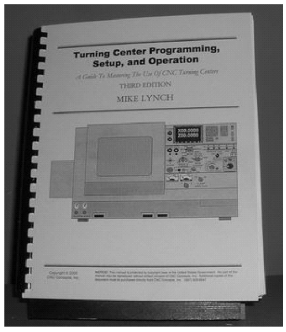
B



C



D



E

Fig. 1-2 English-related working situations

Task 3 Work in pairs. Take turns with your partner asking and answering 5 or more questions. You may ask how, what, when, where, why, etc. Two questions have been given for examples.

1. Can you tell me what machinists do?

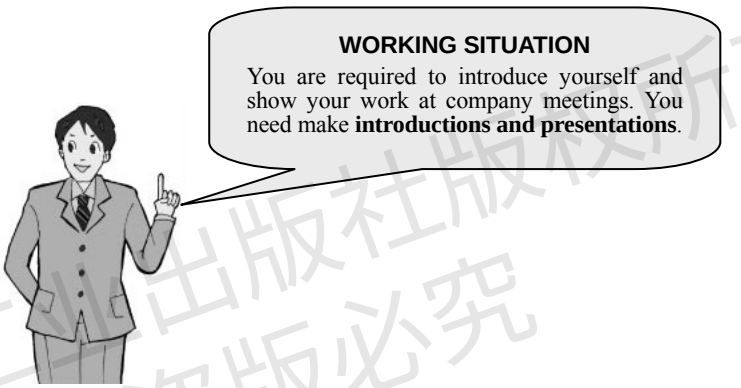
2. In order to plan and perform the operations needed to make machined products, what knowledge do you think is necessary?

3. .....

4. .....

5. .....

Task 4 Work in groups. Give a PPT presentation in the class. Introduce yourself, and then talk about your major and your future work.



【引导文 1】英文自我介绍样例 Personal introduction

Good morning, my name is Xu Peng. It is really a great honor to have this opportunity to speak here. I am 21 years old, born in Jiangsu Province, and I am currently a senior student at Changzhou Institute of Mechatronic Technology. My major is mechanical manufacturing and automation. I have acquired basic knowledge of mechanical manufacturing both in theory and in practice. I realized the importance of English and began to study diligently when I was eighteen. I hope to pass College English Test 6. This is my greatest wish at the moment.

【引导文 2】英文演示引导句 Presentation

- *开场白*:

Good afternoon, ladies and gentlemen. 女士们先生们，下午好！

On behalf of our company I'd like to welcome you here to ... 我代表本公司欢迎你们光临……

Thank you all for coming here. 谢谢大家来到这里！

Let me introduce myself. I'm Ulrike Huber, Manager's assistant ... 让我自我介绍一下，我叫 Ulrike Huber，是经理助理……

I am a consultant to ... 我是……顾问。

- *引出主题:*

The subject of today's presentation is ... 今天汇报的主题是……

I'll give you an overview of ... 我将给大家谈谈关于……

Today I want to update you on ... 今天我想就……方面更新大家的看法。

● *内容提要：*

Let me first give you a brief overview. 首先请允许我简单介绍一下主要内容。

I'll start off by explaining ..., then focus on ... 我从解释……开始，然后重点……

I'll be talking about ... first, then move on to ... 我先谈谈……，然后谈谈……

● *介绍用例句：*

I'm here today to tell you about ... 今天我要向各位汇报的是……

I've divided my presentation into three sections ... 我的报告分成三部分……

Firstly, I'm going to talk about ... 首先，我来谈谈……

Then I'll give you ... 然后，我给大家……

Finally, I'd like to tell you about ... 最后，我想告诉大家的是……

My presentation will take about five minutes ... 我的报告大约需要 5 分钟……

After that there'll be time for your questions ... 汇报完后，请大家提问……

● *演示用例句：*

I'd like to begin by telling you about ... 我想从……讲起。

Let's move on to ... 我们继续谈下一个问题……

If you look at this diagram, you can see ... 大家看这张图，可以看到……

That brings me to ... 那把我带到了……

To sum up then ... 总之……

I'd like to conclude by saying ... 我想用……来总结。

Thank you very much for your attention. 谢谢大家的关注！

If you have any questions, I'll be happy to answer them now. 如果有什么问题，现在我很乐意回答。

【引导文 3】切削机械工（机械制造与自动化专业人才）培养方案 Training program for machinists (Diploma of Mechanical Manufacturing and Automation)

相关课程 Related course	课程内容 Course description	技能、知识、能力需求 Skills, knowledge, and abilities needed
数学 Math	● 大学代数 College Algebra ● 几何 Geometry ● 三角学 Trigonometry ● 微积分 Calculus	● 数学应用能力 Math skills
工程力学 Engineering mechanics	● 运动 Motions ● 力和力矩 Force and torque ● 功和能 Work and energy ● 摩擦 Friction ● 材料强度 Strength of materials	● 必需的物理理论知识及应用能力 Knowledge of physics and the application
计算机应用 Computer application	● Windows ● Word ● Excel ● PowerPoint ● Internet	● 基本的计算机应用能力 Basic computer skills
机械制图 Mechanical drafting	● 读图 Blueprint reading ● 机械制图 Mechanical drafting ● 公差与配合 Tolerances and fittings ● 计算机绘图 AutoCAD	● 阅读、理解技术图纸和标准的能力 Ability with reading and interpreting technical drawings and standards

续表

相关课程 Related course	课程内容 Course description	技能、知识、能力需求 Skills, knowledge, and abilities needed
机械制造基础 Mechanical manufacturing basics	● 材料学 Materials science - 材料特性 Characteristics of materials - 钢和铁材料 Steel and ferrous materials - 非铁金属 Non-ferrous metals - 热处理 Heat treatment - 材料测试 Material testing ● 手动加工 Cutting by hand - 划线 Marking - 錾削 Chasing - 锯 Sawing - 锉 Filing ● 机加工 Cutting by machines - 切削用量 Actions and machine variable - 装备和夹具 Apparatus and clamping elements - 钻 Drilling - 车 Turning - 铣 Milling - 磨 Grinding	● 机械工程材料及金属热加工的基本知识 Knowledge of mechanical engineering material and metal heat working ● 制造工艺和材料的知识 Knowledge of production processes, and materials ● 普通机加工工艺知识和应用 Knowledge of tooling capabilities and applications for manual machining processes ● 安全标准和防护知识 Knowledge of safety standards and safe guards ● 制造公差范围内的零件的能力 Ability to produce parts within tolerances ● 测量零件的能力 Measurement skills
机械制造工艺与装备 Mechanical manufacturing process and apparatus	● 加工工艺 Machining process ● 加工精度 Machining accuracy ● 夹具 Fixtures ● 装配 Assembling	● 机械加工和装配的常规工艺知识，以及一定的夹具和模具设计知识 Knowledge of machining and assembling processes, and fixtures and mould design ● 编制与实施机械加工工艺规程和产品装配工艺规程的能力 Ability with planning and performing the machining operation and products assembling process ● 设计工艺装备的基本能力 Ability with designing process apparatus and fixtures ● 理解并记录质量控制标准的知识 Knowledge of interpreting and documenting quality control standards
液压与气动技术 Hydraulic and pneumatic drive technology	● 液压传动 Hydraulic transmission ● 液压油 Hydraulic oil ● 泵 Pumps ● 液压缸 Hydraulic cylinders ● 控制阀 Control valves ● 液压回路 Hydraulic circuits ● 气动回路 Pneumatic circuits	● 液压、气动技术知识在产品及装备中的应用 Knowledge of hydraulic and pneumatic technology in products and equipment application
电气控制与 PLC Electrical control and PLC	● 电流类型/电磁 Kinds of current/magnetism - 直流 Direct current - 交流 Alternating current - 电磁 Electric magnetism ● 电量测量 Measuring of electric variables - 电功率 Electric power - 电流 Current - 电阻 Resistor - 电压 Electric voltage ● 车床的电气控制 Electrical control of lathe ● 铣床的电气控制 Electrical control of mill ● 可编程控制器 PLC	● 应用电气控制技术和 PLC 技术的能力 Ability with electrical control and PLC application

续表

相关课程 Related course	课程内容 Course description	技能、知识、能力需求 Skills, knowledge, and abilities needed
数控编程 NC programming	● 数控机床特征 Characteristics of CNC machine ● 坐标系 Coordinate system ● 零点 Zero positions ● 数控系统类型 Kinds of control ● 创建数控程序 Creation of NC program ● 固定循环和子程序 Canned cycle and subprograms ● 数控编程–车床 Programming of NC - turning machines ● 数控编程–铣床 Programming of NC - milling machines	● 数控机加工工艺知识 Knowledge of tooling capabilities and applications for CNC machining processes ● 编写数控加工程序及操作的能力 Ability with programming and operation of CNC machine tools ● 同时监控多台机床的能力 Ability to monitor multiple machines at the same time
CAD/CAM 应用 CAD/CAM application	● 二维设计 2D designing ● 三维造型 3D modeling ● 数控编程 NC programming	● 具有 CAD/CAM 软件的基本应用能力 Ability with CAD/CAM software application

Overview of your PPT

Part D　Grammar and Translation

科技英语的特点

科技英语具有下列 5 个特点。

1．专业词汇多

有些专业词汇在普通英语（日常交流）和科技英语里的含义差别很大。

The **overrides** give you the ability to alter the programmed feed and speed**,** spindle direction, and rapid traverse motion. (Ref. LS 5) 修调（倍率）键用于改变程序中设定的进给速度和主轴转速、主轴转向和快速移动速度。 *override 在普通英语中是“践踏，代理佣金”的意思，而在数控技术中常常指“倍率，修调”。*

又如，**apron** 在普通英语中是“围裙”的意思，而在机械领域中是指“车床上的溜板箱”；**engine lathe** 是指普通车床；**pocket** 有时是“刀套”的意思，有时是“槽，凹处”的意思。这类专业词汇很多，只有大量阅读本专业文献，才能很好地掌握。

2．被动语态多

科技英语中大量使用被动语态，这是因为科技文章需要客观地叙述事理，而不是强调动作的主体。为了强调所论述的客观事物，常把它放在句子的首位。

After the layout work **is completed**, machinists perform the necessary machining operations. 规划工作完成以后，机械工就进行必需的加工操作。

Machinists also ensure that the workpiece **is being properly lubricated and cooled**, because the machining of metal products generates a significant amount of heat. 由于对金属件的加工会产生大量的切削热，机械工应确保工件已得到充分润滑和冷却。

Dull cutting tools **are removed and replaced**. 已变钝的刀具会被卸下并更换。

3．定语（从句）多

在科技文章中经常需要说明、定义或限制一些概念、条件等，此时需用定语从句或复杂的限定语来表达。

Lathe is a machine **that turns a piece of metal round and round against a sharp tool that gives it shape**. 车床是一种用尖锐刀具切削旋转金属件的机床，这种尖锐刀具使金属件获得所需的形状。*在定语从句中还套着一个定语从句 that gives it shape*。

Some machinists, **often called production machinists**, may produce large quantities of one part, especially parts **requiring the use of complex operations and great precision**. 一些机械工（经常称为制造机械工）可能要大批量地制造某种零件，尤其是那些操作复杂和对精度要求高的零件。*句中用了过去分词和现在分词作为定语。*

To repair a broken part, maintenance machinists may refer to blueprints and perform the same machining operations **needed to create the original part**. 为了修理坏了的零件，维修机械工要参考图纸，进行与制造新零件所需的相同的机加工操作。

4．非谓语动词多

在英语的简单句中，只能用一个动词作为谓语；如果有几个动词，就必须选出主要动词作为谓语，而将其余动词用非谓语动词形式（*v*.-ing, *v*.-ed, to *v*.三种形式）表示，才能符合英语的语法要求。

There is a lot of manual intervention **required to use** a drill press **to drill** holes. 使用台式钻床钻孔，需要很多人工的干预。*这里用过去分词 required 作为定语，to use, to drill 都是非谓语动词形式描述动作。又如：*

They use their knowledge of the working properties of metals and their skill with machine tools **to plan and carry out** the operations **needed to make** machined products that meet precise specifications. *见 NOTES 2。*

Many computer-controlled machines are partially or totally enclosed, **minimizing** the exposure of workers to noise, debris, and the lubricants **used to cool** workpieces during machining. 很多数控机床是全防护或半防护的，最大程度上减少了工人暴露于噪声、切屑碎片和工件冷却润滑液中的可能性。

5．复杂长句多

科技文章要求叙述准确，用词严谨，因此一句话里常常包含多个分句，这种复杂且长的句子的难度居科技英语之首，阅读、翻译时要按汉语习惯，以短代长，化难为易。

One production machinist, working 8 hours a day, might monitor equipment, replace worn cutting tools, check the accuracy of parts being produced, and perform other tasks on several CNC machines that operate 24 hours a day (lights-out manufacturing). 制造机械工一天工作 8 小时，要监控设备运行，更换磨损的刀具，检查被加工零件的精度，同时在几台 24 小时连续运行（无人值守制造）的数控机床上完成其他工作任务。

The headstock is required to be made as robust as possible due to the cutting forces involved, **which can distort a lightly built housing, and induce harmonic vibrations that will transfer through to the workpiece,** reducing the quality of the finished workpiece. (Ref. LS 2) *见 LS2 之 NOTES 2。*

Task　Translate the following sentences or passage into Chinese.

【提示】首先找出每个句子中的主要动词，再分析其他动词的作用。

1．Some machinists, often called production machinists, may produce large quantities of one part, especially parts requiring the use of complex operations and great precision.

2．Some manufacturing techniques employ automated parts loaders, automatic tool changers, and computer controls, allowing machine tools to operate without anyone present.

3．To repair a broken part, maintenance machinists may refer to blueprints and perform the same machining operations.

4. Some rare but increasingly popular metals, such as titanium, are machined at extremely high temperatures.

5. They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations.

6. Machine setters, or setup workers, prepare the machines prior to production, perform initial test runs producing a part, and may adjust and make minor repairs to the machinery during its operation. Machine operators and tenders primarily monitor the machinery during its operation; sometimes they load or unload the machine or make minor adjustments to the controls. Because the setup process requires an understanding of the entire production process, setters usually have more training and are more highly skilled than those who simply operate or tend machinery. Many workers both set up and operate equipment.（这一段文字说明了 machi ne setter、machine operator/tender 的区别。）