21世纪农业科学专业英语

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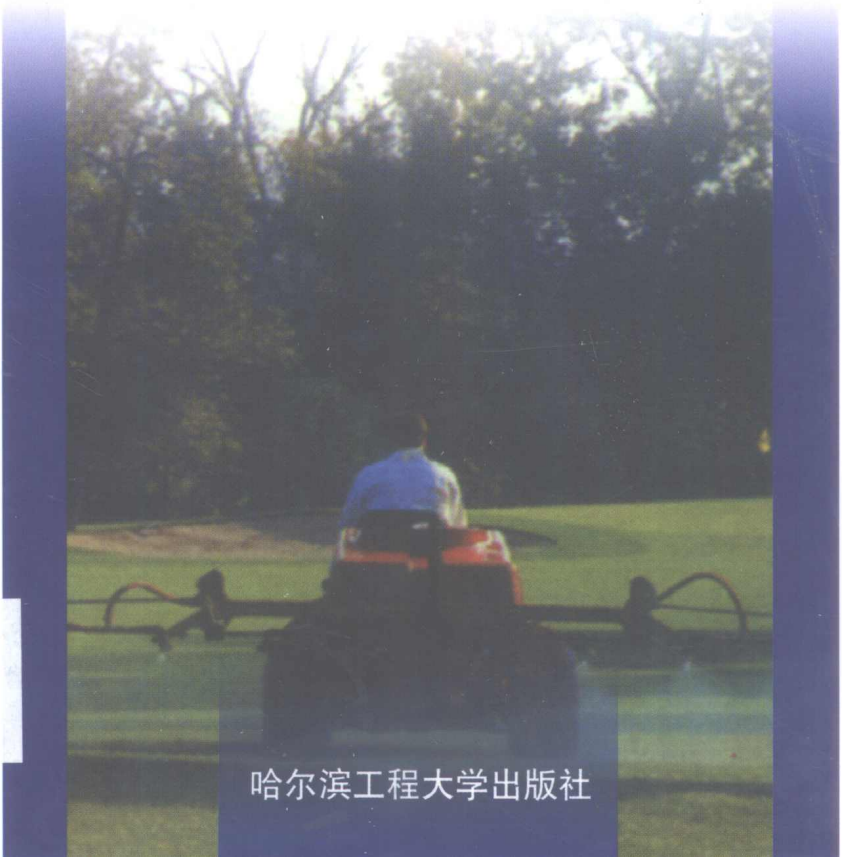
农业工程英语

English Course for Agricultural Engineering

胡家英 乔金友 崔天时 编



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内 容 简 介

本书是为高等院校农业工程专业学生编写的专业英语教材,共分18个单元,内容包括农业机械化及其自动化、农业电气化及其自动化等方面。

全书共分18个单元,每个单元分为Part A精读部分和Part B泛读部分,每课配有专业词汇表,注释与练习,并辅以参考译文和参考答案。

本书既可做本科生的专业英语教材,也可为农业工程类专业技术人员提供参考资料。

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前　言

农业工程是农业现代化的重要标志，它在农业和国民经济发展中具有重要作用。随着改革不断深入，特别是我国加入世界贸易组织后，我们与世界各国的交往迅速增加。国际间农业工程科技合作日益频繁，英语作为一门重要的国际交流语言，其作用日益重要。尤其是加入 WTO 后，专业英语(ESP)人才的需求量增加。专业英语是大学英语的一个重要组成部分，但农业工程方面的专业英语一直是个空白。因此，编写这本书具有重要的现实意义和实用价值。

本教材在编写过程中力求做到以下三点：

1. 本教材按照教学大纲的要求编写，适合农业机械化及其自动化和农业电气化及其自动化专业的学生在学习完一、二年级课程后的第三、四年级使用。

2. 本书在选材方面本着专业基础与专业前沿内容并存的原则，并力求做到广泛性、科学性和前沿性。

3. 在结构方面，本书共设 18 个单元，前 9 个单元为农业机械化及其自动化方面的内容，后 9 个单元为农业电气化及其自动化专业方面的内容。每个单元分为 Part A 精读部分和 Part B 泛读部分，Part A 辅以练习，参考答案及参考译文，供学生参考。Part B 是课堂内容的延伸。

本书由乔金友博士负责 1～9 单元的编译工作，崔天时博士负责 10～18 单元的编译工作，胡家英、高晓惠负责全书的练习和参考译文的编写与整理工作，最后由胡家英统稿，梁俊爽教授主审。

董桂菊、王晓燕、周岭、孙继珍、厉红梅参加了本书的部分编写工作，这里一并致谢。

由于时间仓促，能力有限，书中错误与不当之处在所难免，敬请赐教。

胡家英

2002 年 9 月

Preface

Agricultural engineering is an important symbol of agricultural modernization. It plays a significant role in the development of agriculture and national economy. With the continuously in-depth reform, particularly after China entered into WTO, our contacts with other countries are on the increase. The scientific cooperations of international agricultural engineering are advancing with increasing frequency. English as an important international language for communication, shows great importance day by day. Especially with the entry of WTO, the demand for qualified specialized English personnel is increasing. Although specialized English is a major part of college English, the English for agricultural engineering is still a field which has been seldom mentioned. Therefore our compilation is of both realistic significance and practical value.

We exert ourselves to adhere to the following 3 principles:

1. The teaching material is totally compiled according to the requirements of syllabus. It's a book for the students who major in agricultural machinery & automation and agricultural electricity & automation in their senior year.

2. In the aspect of selecting materials, we focus on both specialized essential materials and specialized literature. We make every effort for the extensive, scientific and advanced knowledge.

3. In the respect of the structure, the book consists of 18 units: the first 9 units is the agricultural machinery & automation section, the left section is for the agricultural electricity & autormation majors. Each unit can be divided into two parts — Part A(intensive reading) & Part B(extensive reading). Part B is the extension of

classroom instruction. Part A contains the corresponding exercises & reference translations for students.

Acknowledgements should be made to the compilers Qiao Jinyou, Cui Tianshi, Hu Jiaying, Gao Xiaohui, Dong Guiju, Wang Xiaoyan, Zhou Ling, Sun Jizhen, Li Hongmei.

However, as it is our first tentative endeavour to collect some of the representative speciments from different aspects of engineering and render them into English, oversights and mistakes are inevitable. We sincerely hope that our readers will give their comments and suggestions without any reserve.

Jiaying Hu
Sep. 2002

Contents

Unit 1

Part A

Fundamentals of Mechanical Design

The Meaning of Design[1]

To design is to formulate a plan for the satisfaction of human need. In the beginning the particular need to be satisfied may be quite well-defined. Here are two examples of well-defined needs.

1. How can we obtain large quantities of power cleanly, safely, and economically without using fossil fuels and without damaging the surface of the earth?

2. This gearshaft is giving trouble; there have been eight failures in the last six weeks. Do something about it.

On the other hand, the particular need to be satisfied may be so nebulous and ill-defined that a considerable amount of thought and effort is necessary in order to state it clearly as a problem requiring a solution[2]. Here are two examples.

1. Lots of people are killed in airplane accidents.

2. In big cities, there are too many automobiles on the streets and highways.

This second type of design situation is characterized by the fact that neither the need nor the problem to be solved[3] has been identified[4]. Note, too, that the situation may contain many problems.

We can classify design too. For instance:

1. Clothing design
2. Interior design
3. Highway design
4. Landscape design

5. Building design
6. Ship design
7. Bridge design
8. Computer-aided design
9. Heating system design
10. Machine design
11. Engineering design
12. Process desing

In fact, there are an endless number since we can classify design according to the particular article or product or according to the professional field[5].

In contrast to scientific or mathematical problems, design problems have no unique answers; it is absured, for example, to request the "correct answer" to a design problem, because there is none. In fact, a "good" answer today may well turn out to be a "poor" answer tomorrow, if there is a growth of knowledge during the period or if there are other structural or societal changes[6].

Almost everyone is involved with design in one way or another, even in daily living, because problems are posed and situations arise which must be solved. Consider the design of a family vacation. There may be seven different places to go, all at different distances from home. The costs of transportation are different for each, and some of the options require overnight stops on the way. The children would like to go to a lake or seashore resort. The wife would prefer to go to a large city with department store shopping, theatres, and nightclubs. The husband prefers a resort with a golf course. When these needs and desires are related to time and money, various solutions may be found. Of these, there may or may not be one or more optimal solutions. But the solution chosen will include the travel route, the stops, the mode of transportation, and the names and locations of resorts, motels, camping sites, or other away-from-home facilities. It is hard to see that there is really a rather large group of interrelated complex factors involved in arriving at one of the solutions to the vacation design problem.

A design is always subject to certain problem-solving constraints. For example, two of the constraints on the vacation

design problem are the time and money available for the vacation. Note, too, that there are also constraints on the solution, in the case above some of those constrains are the desires and needs of each of the family members. Finally, the design solution found might well be optimal. In this case, an optimal solution is obtained when each and every family member can say that he or she had a good time.

A desgin problem is not a hypothetical problem at all. Design has an authentic purpose—the creation of an end result by taking definite action or the creation of something having physical reality. In engineering, the word "design" conveys different meanings to different persons. Some think of a designer as one who employs the drawing board to draft the details of a gear, clutch, or other machine member. Others think of design as the creation of a complex system, such as a communications network. In some areas of engineering, the word design has been replaced by other terms such as systems engineering or applied decision theory. But no matter what words are used to describe the design function, in engineering, it is still the process in which scientific principles and the tools of engineering—mathematics, computers, graphics, and English—are used to produce a plan which, when carried out, will satisfy a human need[7].

Mechanical Engineering Design

Mechanical design means the design of things and systems of a mechanical nature—machines, products, structures, devices, and instruments. For the most part, mechanical design utilizes mathematics, the material sciences, and the engineering mechanical sciences.

Mechanical engineering design includes all mechanical design, but it is a broader study because it includes all the disciplines of mechanical engineering, such as the thermal-fluids sciences, too. Aside from the fundamental sciences that are required, the first studies in mechanical engineering design are in mechanical design.

The Phases of Design

The total design process is of interest to us, how does it begin? Does the engineer simply sit down at his or her desk with a blank sheet of paper and jot down some ideas? What happens next? What factors influence or control the decisions, which have to be made? Finally, how does this design process end?

The complete process, from start to finish, is often outlined as in Fig. 1 – 1 The process begins with a recognition of a need and a decision to do something about it, after many iterations, the process ends with the presentation of the plans for satisfying the need.

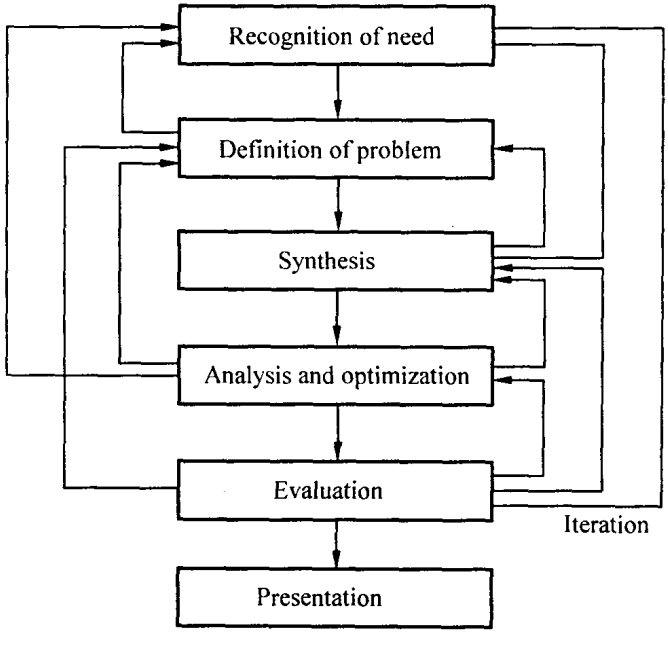

Figure 1 – 1 The phases of design

Technical Terms

nebulous [ˈnebjuləs] *a*.星云的,模糊不清的,云雾状的
constrain [kənˈstrein] *vt*.强制,压制,束缚,拘束
resort [riˈzɔːt] *n*.休假地;成群结队地前往;依靠力量;常去之地,求助;*vt*.把…再分类;前往;求助;重新拣选
hypothetical [ˌhaipəˈθetikl] *a*.假设的,爱猜想的,假言的
authentic [ɔːˈθentik] *a*.可靠的,真正的,有根据的
thermal-fluids 热流体
handicapped [ˈhændikæpt] *a*.有障碍的,残疾的
fraternal [frəˈtəːnl] *a*.兄弟的,兄弟般的,兄弟会的;*n*.互助会
iteration [ˌitəˈreiʃən] *n*.& *v*.重复,叠代,重复说的话
jot down 草草记下

Notes

1. Design: To design is to formulate a plan for the satisfactions of human need.
设计:设计就是为满足人的需求而形成的计划。这是广义设计的概念。
2. On the other hand, the particular need to be satisfied may be so nebulous and ill-defined that a considerable amount of thought and effort is necessary in order to state it clearly as a problem requiring a solution.
整句是 so…that 结构。不定式结构的被动形式 to be satisfied 作后置定语,修饰主语 the particular need; that 从句中又有表目的短语 in order to。as…引导表时间的短语作状语。
3. Problem-solving: A basic kind of thinking that has received

much study by psychologist and other students of behaviour.
问题求解:主要为心理学家和其他行为学专家所研究的一种基本思维方法。在设计哲学中,常常把设计定义为问题求解过程或决策过程(decision－making process)。

4. This second type of design situation is characterized by the fact that neither the need nor the problem to be solved has been identified.
整句为被动语态。That…引导定语从句修饰 the fact, 不定式 to be solved 作后置定语,修饰 the problem。

5. In fact, there are an endless number since we can classify design according to the particular article or product or according to the professional field.
Since 引导原因状语从句,article or product 为并列成分,而 or according to …与前一 according to 构成并列成分。

6. In fact, a "good" answer today may well turn out to be a "poor" answer tomorrow, if there is a growth of knowledge during the period or if there are other structural or societal changes.
实际上,如果某段期间的知识在增长变化,或存在其它的结构变化或社会变化,今天的"好"的答案,到明天就可能是"差"的答案。

7. But no matter what words are used to describe the design function, in engineering, it is still the process in which scientific principles and the tools of engineering—mathematics …—are used to produce a plan which, when carried out, will satisfy a human need.
全句分两部分,由 no matter what 引导 状语从句,主句是"in engineering, it is…"。在主句中,"— … —" 是插入部分,in which 引导定语从句修饰 process;后一个 which 也引导定语从句修饰 plan,但在这个定语从句中,还有由 when 引导的时间状语从句。

Exercises

Ⅰ. Multiple choice.

1. The design problem usually has _____ answers.
   A. one B. two C. more than one D. three
2. A design can be defined as _____.
   A. to form or conceive in the mind
   B. to contrive a plan
   C. to plan the form of a system or structure
   D. to prepare the preliminary sketches and/or plans for a system that is to be produced
3. After the recognition of the need, what shall we do in the next step? _____
   A. Do some engineering drawings.
   B. Definition of the problem.
   C. Collect second－hand data.
   D. Synthesis.
4. A need is usually _____.
   A. potential B. obvious C. nebulous D. unkown
5. The constrains on the vacation design problem are as follows, except _____, according to the text.
   A. money B. desires C. needs D. number of people

Ⅱ. Answer each of the following questions.

1. What is the definition of design according to the text?
2. Why is a design not a hypothetical problem?
3. What is the relation between mechanical engineering design and mechanical design?
4. Please describe the design process in your own words.
5. Try to describe another process in your own life in English

Ⅲ. Decide whether the following statements are true or false.