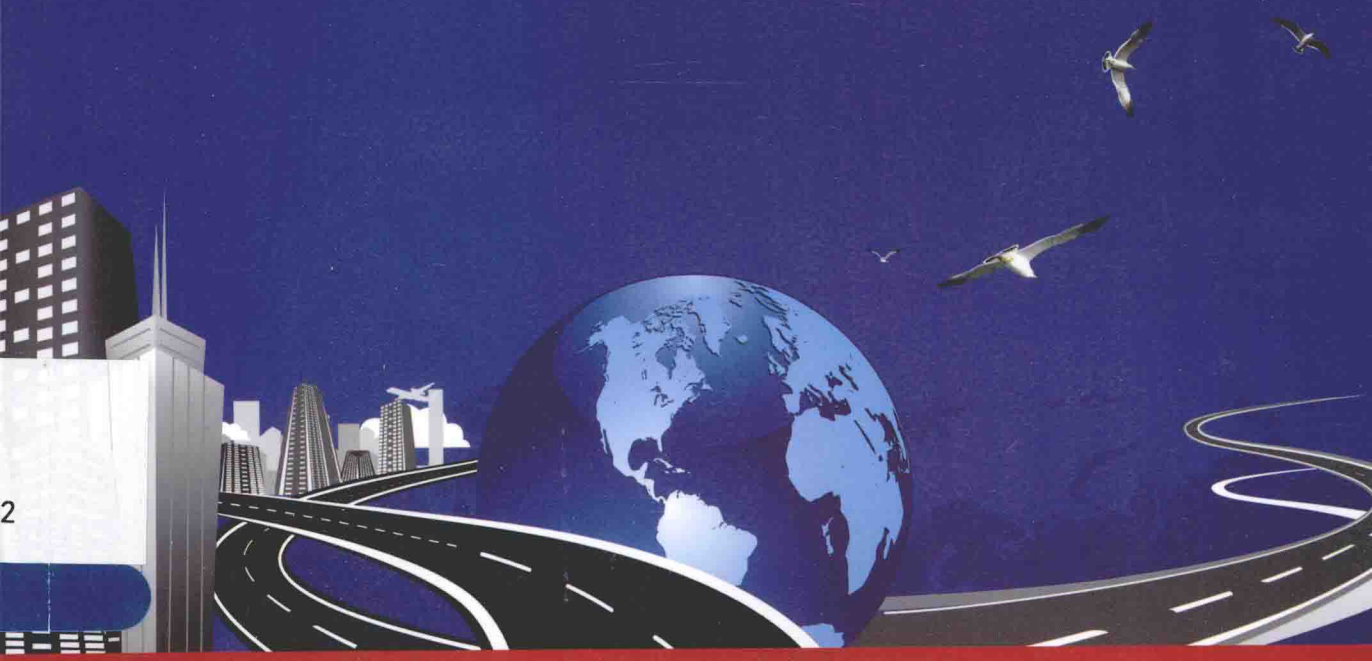
Subject-Based English

高等学校专业英语教材

工程管理

专业英语教程（第2版）

☆熊 英 主编☆



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高等学校专业英语教材

工程管理专业英语教程
（第2版）

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内容简介

本书旨在使读者掌握工程管理相关专业英语术语及用法，培养和提高读者阅读和翻译专业英语文献资料的能力，以及口头表达能力。本书由12个主题单元组成，主要内容包括建筑的主要类型、项目管理、项目的生命周期、项目计划、成本估算的方法、成本控制，建设工程项目融资、合同条款、进度计划、工程的质量控制和保证、招投标、索赔等内容。每个主题单元由2篇课文、2篇阅读材料、课文词汇、课文注释和练习组成，在书后还附有课文参考译文。为了方便教学和锻炼学生英语听力，本书另配有电子教案，并提供部分视听素材，向采纳本书作为教材的教师免费提供，读者可登录华信教育资源网 www.hxedu.com.cn 注册下载。

本书可作为工程管理专业的专业英语教材，也可供从事相关专业的人员学习参考。

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前　言

目前，随着我国国际交流和全球化市场经济的快速发展，对大学生专业英语水平的要求也越来越高。大学生除了要能顺利地阅读相关的专业英文文献之外，其专业英语的听力和口语水平也需要进一步提高，以便更好地适应日益激烈的国际化竞争。

工程管理作为一门新兴学科，目前问世的相关专业英语书籍并不太多。本书的作者在阅读了大量工程管理专业英语的文献之后，精心选材，编写成册。其目的在于帮助工程管理专业的本科生掌握本专业的英文术语，进而提高他们专业英语的听力和口语水平。此外，经过大量的口语和阅读训练，学生应用专业术语的能力会进一步增强，这必为将来的工作打下坚实的基础。

本书包括12个单元，内容涉及建筑的主要类型、项目管理、项目的生命周期、项目计划、成本估算的方法、成本控制，建设工程项目融资、合同条款、进度计划、工程的质量控制和保证、招投标、索赔等问题。课后配有对重点词汇的发音和讲解以及针对文章的问题设计，学生通过回答问题不仅能更进一步了解工程管理专业的知识，而且能进一步提高自己专业英语的听说能力。

为了方便教学和锻炼学生英语听力，本书另配有电子教案，并提供部分视听素材，向采纳本书作为教材的教师免费提供（获取方式：登录电子工业出版社华信教育资源网 www. hxedu. com. cn 或电话联系 010-88254531 获得）。

由于时间有限，若有疏漏失当之处，望读者指正。

编　者

Contents

Unit One

The Importance of Management in Civil Engineering

Lesson 1 Emerging Role of Management in Civil Engineering

During the past two decades, many civil engineering firms have grown substantially in staff size, disciplines, and geographic areas served. These conditions have created a demand for civil engineers with special skills in project management.

Managerial skills have become important because many of these civil engineering firms have grown substantially in recent years. Several have more than 5000 employees with over 500 projects and over 100 offices. Every large project requires a manager. Every standalone office requires a senior manager. A logic question is how these managers, who require business skills, are developed from a pool of civil engineers who are trained as technical experts[1] Obviously, most managers have had many years of on-the-job training. However, there is now a greatly increased demand and few firms have either the facilities or the staff to produce this training in-house. Therefore, firms are increasingly looking to the outside for management training of staff.

A few of universities in America have recognized the need and have developed curricula to promote development of the required skills. For example, at Northwestern University, one of the hottest new graduate programs in civil engineering is the Master's in Project Management (MPM) and it includes such subjects as:

1. Financial issues for engineers;
2. Bargaining and negotiations;
3. Human resources management;
4. Project scheduling;
5. Accounting issues for engineers;
6. Engineering law.

The selection of these courses is based on an appraisal of the skills actually needed in civil engineering management. This is confirmed by the fact that the American Society of Civil Engineers (ASCE) journal is advertising for papers on various areas of management such as project, program, operations, personnel, financial, marketing, and legal issues, since all are now considered important facets of civil engineering management[2].

If one examines the staffing requirements of the larger firms, it can be noted that they employ large staffs in the legal, accounting, marketing, financial, personnel and business management areas. When projects are primarily located in the United States, the necessary logistic support can be provided by temporarily transferring support staff from the home-office pool. When the projects are based in remote locations, particularly overseas, and when the client requires the design to be carried out locally, it becomes necessary to provide a project manager possessing not only well-honed engineering skills and good judgment, but other skills in contract management, such as those needed to negotiate changes in project scope and duration[3].

While E-mail and fax machines have made it easier to get guidance from the home office, many decisions must still be made in the field. The local manager is frequently required by the client to have power of attorney, to ensure that all agreements made in the field are legally binding. If minor problems arise, the cost of overseas travel to remote areas such as Asia, Africa, and Latin America makes it impractical to send out a home office specialist every time a legal, accounting, personnel, scheduling, or negotiating problem arises. Consequently, one must depend on the local manager to successfully address a wide range of issues and call for help when major emergency arises.

While professional advancement in major companies can come either to those taking technical or managerial training, in our experience, those following the managerial track generally end up with higher recognition and compensation, because good management is so important in getting projects finished on time, on budget, and to the client's satisfaction[4]. Besides that, good technical engineers are more abundant than civil engineering managers and compensation follows the laws of supply and demand.

In summary, it is intended to show why a modern civil engineer interested in professional growth requires an understanding of and skills in management, law, accounting, and personnel over and above the normal civil engineering training. The growth of mega firms as well as large public enterprise, has accelerated the need for such managers. Fortunately, civil engineers with managerial skills command an appreciably greater salary than those with only engineering skills. Hopefully, this economic incentive will attract some of the best and brightest civil engineers into the field of management.

Words and expressions

1. on-the-job training 在职培训
2. in-house 机构内部的
3. curricula [kə'rikjulə] *n.* 课程
4. human resource management ['hju:mən ri'sɔ:s 'mænidʒmənt] 人力资源管理
5. accounting [ə'kauntiŋ] *n.* 会计学,会计
6. appraisal [ə'preizəl] *n.* 评价,鉴定
7. legal ['li:gəl] *adj.* 法律的
8. facet ['fæsit] *n.* 面,方面
9. logistic [ləu'dʒistik] *adj.* 后勤的,后勤学的
10. hone [həun] *v.* 把……放在磨石上磨
11. attorney [ə'tə:ni] *n.* 律师,代理人
12. compensation ['kɔmpen'seiʃən] *n.* 补偿,补偿费
13. mega ['megə] *n.* 百万,大
14. accelerate [æk'seləreit] *vt.* 加速

Notes

[1] A logic question is how these managers, who require business skills, are developed from a pool of civil engineers who are trained as technical experts.

"a pool of civil engineers" 指"众多的土木工程师"。

此句译为:一个逻辑性的问题是,那些被培训为技术专家的土木工程师将如何脱颖而出,发展成为具备商务技巧的管理者?

[2] This is confirmed by the fact that the American Society of Civil Engineers (ASCE) journal is advertising for papers on various areas of management such as project, program, operations, personnel, financial, marketing, and legal issues, since all are now considered important facets of civil engineering management.

ASCE: 美国土木工程师协会。

此句译为:这一点已有事实为证,美国土木工程师协会会刊登广告征集各种类型的管理学论文,内容包括工程、项目、操作、人事、财经、市场营销及法律等各种问题,因为所有的这些现在都已经被列为土木工程管理的重要方面。

[3] When the projects are based in remote locations, particularly overseas, and when the client requires the design to be carried out locally, it becomes necessary to provide a project manager possessing not only well-honed engineering skills and good judgment, but other skills in contract management, such as those needed to negotiate changes in project scope and duration.

"well-honed" 指"精湛的"。

此句译为:当工程项目在异地,尤其是在国外的时候,并且客户要求在当地完成设计,公司就很有必要请一名项目经理,既要精通工程技术,有很好的判断力,同时也要谙熟合同管理,以便在必要的时候就工程范围和工期变动问题随时跟客户进行磋商。

[4] While professional advancement in major companies can come either to those taking technical or managerial training, in our experience, those following the managerial track generally end up with higher recognition and compensation, because good management is so important in getting projects finished on time, on budget, and to the client's satisfaction.

此句译为:虽然大公司所取得的专业方面的进步可能来源于技术或管理知识的培训,但根据我们的经验,那些注重发展管理的公司最终会赢得更高的赞誉和认可,因为好的管理能确保工程在财政预算内按期完成,并达到客户满意。

Questions

1. Why are managerial skills highly demanded in civil engineering?

2. What are the main subjects one should learn in order to get MPM (Master's in Project Management)?

3. Why is it necessary to provide a local manager? What kind of qualities should he possess?

Lesson 2 The Construction Industry

Construction is essentially a service industry, whose responsibility is to convert the plans and specifications prepared by an engineer or an architect into a finished project.

The construction of projects involves thousands of details and complex interrelationships among owners, architects, engineers, general contractors, speciality contractors, manufacturers, material dealers, equipment distributors, governmental bodies and agencies, labor, and others[1].

The contractor assumes the responsibility for the delivery of the completed facility at a specified time and cost. In so doing, he accepts legal, financial, and managerial obligations.

Construction accounts for 15 out of every 100 jobs and consumes more basic and finished materials than any other industry.

Under the stimulus of increasing demand for its services, the construction industry has expanded and is expanding in geographical scope and technological dimension[2].

Construction is the translation of a design to reality. It is as important and complicated as the design in order that the structure should perform as it was intended to and the work is finished within the required time at the lowest cost[3].

The designer must be in close contact with everything that is done during the construction work so that any changes in the site conditions, materials and work being done can be evaluated and, if necessary, corrected or improved[4].

The constructors should have the same knowledge of the working-plan as the designer. They must also know the details of the design and must understand any unusual aspect of the design. In fact, the constructors should go to the engineer for information and advice during the design stage so that the plans do not call for something that cannot be built economically[5]. Both the designers and constructors must always work in harmony.

More workers are employed during the peak period. The employees should be given training for wording skills and knowledge about quality and safety as early as possible. It will improve the working efficiency a lot.

The construction work can be divided into a number of stages:

1. Evaluation of plans, specifications, basic demands and features of the site.
2. Plan and speed of the job.
3. Making the site ready.
4. Building the structure.
5. Cleaning up.

The first stage of evaluation consists of a careful study of demand of design and of the site itself. Too often this is not done until the third and fourth stages are under way, which is far

too late. The second stage is most important if the job is to be done economically. The equipment, labor and materials for each stage in the construction must be provided at the correct time.

The third includes constructing access roads, making the warehouse, concrete mixers, offices and housing for the workmen ready[6]. Of course, this work is often just the beginning; the arrangements are changed several times during the progress of the work. The major part of the time and money is spent on the building stage.

With the development of science and technology, construction methods will change in all areas. Many daily functions will become automated and computer-controlled, especially in residential constructions. Thus there will be a demand for more skilled workmen, primarily those having technical background.

Words and expressions

1. architect ['ɑ:kitekt] *n.* 建筑师
2. general contractor ['dʒenərəl kən'træktə] *n.* 总承包商
3. material dealer [mə'tiəriəl 'di:lə] *n.* 材料经销商
4. equipment distributor [i'kwipmənt dis'tribjutə] *n.* 设备批发商
5. geographical scope [ˌdʒiə'græfikəl skəup] *n.* 地理范围
6. technological dimension [ˌteknə'lɔdʒikəl di'menʃən] *n.* 技术尺度，技术因素
7. site conditions [sait kən'diʃənz] *n.* (建筑)工地条件
8. in harmony [in'hɑ:məni] 和谐
9. peak period [pi:k'piəriəd] *n.* 顶峰阶段
10. evaluation [iˌvælju'eiʃən] *n.* 估价，评价
11. residential construction [ˌrezi'denʃəl kən'strʌkʃən] *n.* 住宅建设

Notes

[1] The construction of projects involves thousands of details and complex interrelationships among owners, architects, engineers, general contractors, speciality contractors, manufacturers, material dealers, equipment distributors, governmental bodies and agencies, labor, and others.

此句译为：项目的建造包括诸多细节和各种各样复杂的关系，例如处理和业主、建筑师、工程师、总承包商、专业承包商、厂商、材料经销商、设备经销商之间的关系，以及和政府各部门和各机构、劳动者等人的关系。

[2] Under the stimulus of increasing demand for its services, the construction industry has expanded and is expanding in geographical scope and technological dimension.

此句译为：在人们对建筑业的各种服务的需求不断增长的刺激下，建筑业在地理范围和技术尺度上已经且正在逐渐扩大着。

[3] It is as important and complicated as the design in order that the structure should perform as it was intended to and the work is finished within the required time at the lowest cost.

此句译为:为了让工程按照预期的结构,在规定的时间内以最低的成本完成,施工也同设计一样重要和复杂。

[4] The designer must be in close contact with everything that is done during the construction work so that any changes in the site conditions, materials and work being done can be evaluated and, if necessary, corrected or improved.

此句译为:设计者必须对建筑过程中的任何一项完成的工作极为关注,这样对于现场条件、材料和施工工作的任何改变都能做出评估,并且如果必要的话,还可以及时改正和改进。

[5] In fact, the constructors should go to the engineer for information and advice during the design stage so that the plans do not call for something that cannot be built economically.

此句译为:事实上,建造师应该在工程的设计阶段就向工程师寻求信息和建议。这样,施工计划就能避免那些不经济的建造情况。

[6] The third includes constructing access roads, making the warehouse, concrete mixers, offices and housing for the workmen ready.

此句译为:第三个阶段包括建造出入通路,准备好仓库、水泥搅拌机、办公室和民工的住处。

Questions

1. What is construction? Why is the construction of projects so complicated?
2. What should designers and constructors do in order to cooperate with each other harmoniously?
3. Give a brief analysis of the five steps of construction.

Reading Material

Passage 1 Construction Management

In construction management, the owner contracts with an architect-engineer for project design and with a construction management firm for consulting, procurement, contract letting, and construction administration services. In so doing, a construction team is created consisting of the owner, the architect-engineer, and the construction manager (CM). The job objective of this approach is to treat project planning, design, and construction as integrated tasks within a construction system. The CM works with the owner and the architect-engineer from the beginning of design until project completions, providing leadership to the construction team in all matters pertaining to construction. Adherence to construction schedules quality and budget constraints is the CM's prime responsibility.

During the design phase, the CM advises with respect to performance criteria, construction feasibility of alternative building systems, site conditions, and availability of materials and labor. Information pertaining to trade jurisdictions and temporary job facilities is also provided. Where long lead-time machinery, equipment, or materials are needed, the CM will make arrangements for their procurement and delivery. During the design process, the CM prepares preliminary, interim, and final project budgets and construction schedules. Fast tracking and phased construction are frequently used on projects of this type. The construction manager handles the bidding and contract award process whereby work is contracted out to a succession of constructors as the various design phases are finalized. The CM usually does not perform significant construction work with his own forces.

During construction operations, the CM assumes the responsibilities for the supervision, coordination, and administration of the project. Of top importance in this regard are coordinating the work of the separate contractors, checking the actual progress of the project against an established time schedule, and exercising every effort to keep the cost of the work within the approved budget. Also often involved are quality control, safety, progress payments, contract changes, claims, expediting, shop drawings, acceptance testing, and other elements of construction administration. The extent of services to be provided by the CM can be tailored to suit the individual owner's requirements.

Two different types of construction management contracts can be used. Under one type the CM is made the agent of the owner. All actions of the CM, such as purchasing, contracting, disbursement, and construction supervision, are carried out in the name of and on behalf of the owner. Under principles of agency, the owner is fully responsible for the actions of the CM. Another type of management contract is that in which the CM is engaged as an independent contractor. In this case his actions are taken in his own name and on his own responsibility. The CM is liable for his own actions and remains responsible for the work

until its completions and acceptance by the owner. Public owners cannot ordinarily make the CM their agent. Private owners, on the other hand, can and normally do in practice.

Passage 2 Project Management and the Computer

The increasing development and application of quantitative management methods require project managers to manipulate, summarize, and interpret larger and larger volumes of numerical data. The computation of most forms of quantitative information is rote procedures and essentially clerical in nature. Despite the simplicity of the data reduction procedures, however, manual methods can involve appreciable time and expense, and computational errors are always possible. To an ever larger extent, the project manager is relying on the digital computer and associated items of data processing equipment to provide management information. Project managers must react quickly to the changing conditions, and their decisions should be made with the secure knowledge that they are acting on the basis of adequate, accurate and current information. The computer can help to make this possible as well as to assist with the evaluation of alternative courses of action. The computer can be a powerful tool for labor and equipment management. Computers are widely used by construction contractors in conjunction with their project cost systems. Because cost accounting and analysis can become laborious and time-consuming, even for relatively small operations, the computer has economic, speed, and accuracy advantages over manual methods. With the computer doing much of the tedious, time-consuming, and repetitious calculations, the contractor can devote additional time to developing more profitable approaches.

Listed are project functions to which the computer is currently being successfully applied:

1. Project scheduling. The computer generates calendar-date schedules for all project activities as well as completions times for the project and for intermediate milestones. Included are updating calculations, least cost shortening of the project, and the scheduling and allocation of manpower and construction equipment.

2. Payroll and labor costs. Using time card input, the computer prepares payroll checks, periodic and special payroll reports, productivity rates, and labor unit costs. Production rates and unit costs are summarized for control purposes on current projects, classified and stored for use on the estimating of new work.

3. Equipment records and costs. The computer maintains records on ownership and operating costs, hours of operation, maintenance and production rates for each major item of operating equipment. Equipment production rates and unit costs of production are developed for cost control and the estimating of future projects.

4. Accounting and record keeping. The computer is applied to general accounting operations such as general ledger accounts, subcontractor accounting, accounts payable,

progress billing cash forecasting, and financial statements. Included is the maintenance of all project cost accounts.

5. Estimating. The computer, working closely with the estimator and using stored productivity and cost information, generates construction costs of all kinds.

Computers are now beginning to be used in conjunction with modeling techniques that simulate various project management activities. Determining the influence of weather on construction progress and economics, forecasting the effects of different purchasing policies on a company's cash flow, and optimizing repetitive construction operations are all examples of computer application to the solution of specific management problems. How successfully these esoteric methods can be applied to everyday project management situations remains to be seen.