

**清华大学**

**2010-2011 学年度**

**春季学期全英文授课课程内容简介**

**Introduction to the Graduate Courses**

**Taught in English in the Spring Semester of**

**2010-2011**

# Catalogue

## **School of Architecture**

Indoor Air and Health:Past,present and future

## **School of Life Sciences**

Biochemistry(1)(in English)

## **Department of Industrial Engineering**

Welding Technology(I)

Manufacturing Technology(II)

Production Management II

Enterprise Information Resource Management

Advanced Quality Management

Logistics & Supply Chain Management

Globe Manufacturing Strategy

Manufacturing Engineering

Engineering and Technology Management

## **Department of Environmental Science and Engineering**

Advanced Environmental Chemistry

Advanced Wastewater Treatment

Restoration Ecology and Applications

Global Environmental Issues

Hazardous Waste Disposal

Air Pollution Chemistry

## **Department of Computer Science and Technology**

Human Computer Interaction Technology

Future Internet Architecture

Web Information Retrieval

Database Technologies

Fundamentals of Computer Graphics

## **Department of Automotive Engineering**

Mechatronic Systems in Automotive Engineering

Automotive Engineering II

Internal Combustion Engines II

## **Department of Chemical Engineering**

Surface Science and Heterogeneous Catalysis

## **School of Journalism and Communication**

Global Business Journalism (advanced)

Feature Writing in English

Intercultural Communication

Public Speaking

## **School of law**

Chinese Practice of WTO Law

International Natural Resources Law

## **The Graduate Courses Taught in English in the School of Architecture**

**【Course Number】** 40990181

**【Course Title】** 室内空气品质和健康概论 Indoor Air and Health:Past,present and future

**【Credits】** 1 **【Semester】** Spring

**【Instructor】** H.C. Bekkering

**【Brief Introduction】**

The history, presence and future of indoor air quality and health are introduced. This course can provide students a general knowledge on indoor air quality and health. In addition, students' abilities of written and oral English can be improved.

## **The Graduate Courses Taught in English in the School of Life Sciences**

**【Course Number】** 30450203

**【Course Title】** 生物化学(1)(英文) Biochemistry(1)(in English)

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Liu Dong

**【Brief Introduction】**

The main purpose of this course is to teach the students the basic concepts in biochemistry, which includes the structures and functions of proteins, nucleic acids, carbohydrates, lipids and biomembranes. We will also put the emphasis on enzyme kinetics and molecular mechanisms of signal transduction of the cells. Besides lectures, we will also discuss the problems and answer the questions to the students through the websites or one-to-one meeting. There are will be some homework assignments to students after each lecture. We will also recommend some original research articles for students to read to further raise their interests in biochemistry.

**【Assessment】** Exam

## **The Graduate Courses Taught in English in the Department of Industrial Engineering**

**【Course Number】** 70160273

**【Course Title】** 焊接技术 I Welding Technology(I)

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Wu Su

**【Brief Introduction】**

**【Course Number】 70160383**

**【Course Title】 制造技术 II Manufacturing Technology(II)**

**【Credits】 3 【Semester】 Spring**

**【Instructor】 Zhang Wei**

**【Brief Introduction】**

**【Course Number】 70160483**

**【Course Title】 生产管理 II Production Management II**

**【Credits】 3 【Semester】 Spring**

**【Instructor】 Cao Hui**

**【Brief Introduction】**

**【Course Number】 80160033**

**【Course Title】 企业信息资源管理 Enterprise Information Resource Management**

**【Credits】 3 【Semester】 Spring**

**【Instructor】 Cao Hui**

**【Brief Introduction】**

1. Preliminaries:Database/Production operation and management/management/information technology
2. Enterprise systems and modelling
3. Enterprise information systems
4. Design for enterprise information systems
5. Operation of enterprise information systems

**【Course Number】 80160172**

**【Course Title】 高等质量管理学 Advanced Quality Management**

**【Credits】 2 【Semester】 Spring**

**【Instructor】 Wang Kaibo**

**【Brief Introduction】**

**【Course Number】 80160223**

**【Course Title】 物流与供应链管理 Logistics & Supply Chain Management**

Introduction to Decision Making

**【Credits】 3 【Semester】 Spring**

**【Instructor】 Huang Simin**

**【Course Number】 80160293**

**【Course Title】 全球化制造战略 Globle Manufacturing Strategy**

**【Credits】 3 【Semester】 Spring**

**【Instructor】 Gu Xueyong**

**【Brief Introduction】**

This course will provide an overview to the brief history of manufacturing technologies and related social and political strategies operated by manufacturers and local governments. We will discuss multiple factors that affect manufacturing strategies, including human resources, natural and technical resources, and the management of intellectual properties. We hope that students could learn from an interactive style by running debate sessions, and in-class presentations, so that they can emulate the decision procedures in formulating or articulating global manufacturing strategies. This course will contain a series of systematic discussion covering topics such as: communication and financial engineering tools, logistic management, and the impact of WTO and NAFTA. We will also spend time to observe and relate the latest development in manufacturing technologies, and the special applications of sensor networks and their influence on manufacturing strategies around the world.

**【Course Number】** 80160303

**【Course Title】** 制造工程 Manufacturing Engineering

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Zheng Li

**【Brief Introduction】**

This course provides in-depth understanding of the structure and function of modern production systems with emphasis on the roles that techniques and technologies play in production. Topics include basic concepts and models, manufacturing processes, automation and control technologies, manufacturing system analysis and planning, and manufacturing support systems. This course includes three lab experiments on production automation and one project on assembly line design.

**【Course Number】** 80160363

**【Course Title】** 工程与技术管理 Engineering and Technology Management

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Cui Bisheng

**【Brief Introduction】**

- Engineering and Management
- Functions of Technology Management
- Human Aspects of Organizing
- Leading Technical People
- Engineers in Marketing
- Globalization
- Engineering Economy

**The Graduate Courses Taught in English in the Department of Environmental Science  
and Engineering**

**【Course Number】 70050323**

**【Course Title】 高等环境化学 Advanced Environmental Chemistry**

**【Credits】 3 【Semester】 Spring**

**【Instructor】 Yu Gang**

**【Brief Introduction】**

By learning Advanced Environmental Chemistry, the students will grasp the methodology of studying the transport, transformation and fate of pollutants using chemical principle and approaches, with the concept of multimedia in their mind. Also they will get good understandings about the environmental problems especially for those current hot issues - case studies will illustrate their chemical mechanism as well as the latest progress.

The course mainly contains four parts:

- (1) Environmental pollution chemistry, which mainly talks about the main environmental problems and their chemical mechanism, and the transport, transformation and fate of pollutants.
- (2) Environmental analytical chemistry, which mainly talks about the monitoring and analysis methods for priority pollutants with important environmental significance.
- (3) Environmental toxicological chemistry, which mainly talks about the dose-response relationship, kinetics, and the mechanism for teratogenesis, mutagenesis and carcinogenesis.
- (4) Environmental Engineering Chemistry, which mainly talks about the technical principles of chemical approaches of pollution control.

**【Course Number】 80050233**

**【Course Title】 高级废水处理工程 Advanced Wastewater Treatment**

**【Credits】 3 【Semester】 Spring**

**【Instructor】 Wen Xianghua**

**【Brief Introduction】**

This course provides various kinds of engineering issues related to water environment in English, which cover fundamental knowledge, the latest technologies, including wastewater reuse & disinfection, anaerobic biological treatment technologies, membrane technology, biological nutrient removal technology, and etc., and regional application examples. These lectures, will also arrange English presentations by students, and discussions to enhance English capability and internationality of students.

**【Course Number】 80050243**

**【Course Title】 恢复生态学及其应用 Restoration Ecology and Applications**

**【Credits】 3 【Semester】 Spring**

**【Instructor】** Liu Xuehua

**【Brief Introduction】**

Theoretic and practical research of restoring the degraded ecosystems is the hot topic in the modern ecological development. This course mainly contains the following contents: the degraded ecosystems under human disturbance, contents and development of restoration ecology, general introduction of global ecological restoration, restoration of degraded forest ecosystem, restoration of wetland ecosystem, restoration of grassland ecosystem, restoration of ocean and coast zone ecosystems, restoration of abandoned-land ecosystems, restoration of urban ecosystem. Restoration ecology is one of the key courses in Ecology. The students in Ecology, Ecological conservation and Environmental protection are requested to select it for credit.

**【Course Number】** 80050253

**【Course Title】** 全球环境问题 Global Environmental Issues

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Hao Jiming

**【Brief Introduction】**

The course will target to five important global environmental issues, including 1) global climate change, 2) Persistent Organic Pollutants, 3) curriculum-transboundary movement of hazardous waste and international chemicals management, 4) biodiversity and conservation, and 5) global and regional air pollution.

On the global climate change, the following aspects will be introduced: the scientific evidence and courses of global climate change, the impacts of and adaption to climate change, the social economic impacts of mitigation, the UNFCCC and its negotiation progress, the global carbon market, the global energy issues, and so on. Several discussion topics will be identified among the aforementioned issues.

Regarding the issue of Persistent Organic Pollutants (POPs), the course will firstly introduce the Origin of POPs as an environmental concern, followed by Properties and global transport of POPs, Process of developing the nternational treaty, Main POPs included in the Stockholm Convention, Obligations required by the Stockholm Convention, Existing barriers for developing coutries to implement the Convention, Obligation of developed countries in fianacial and technology transfer, Trend and main problems of the Stockholm Convention. The discussion topics will focus on listing new POPs into the Stockholm Convention.

The part on curriculum-transboundary movement of hazardous waste and international chemicals management will cover the following issues: International Conventions related to transboundary movement of hazardous waste and international chemicals management will be introduced and discussed in this course. Based on the introduction of hazardous waste, origin, main content and development trend of Basel Convention will be instructed, with an emphasis on hot topics. The content of Rotterdam Convention, Strategic Approach to International Chemicals Management (SAICM) and relations between international environmental topics and the above Conventions will

**【Course Number】 80050263**

**【Course Title】 危险废物处置技术 Hazardous Waste Disposal**

**【Credits】 3 【Semester】 Spring**

**【Instructor】 Li Jinhui**

**【Brief Introduction】**

Solid waste pollution control and reclamation is one of the most popular topics in the field of environmental protection. Concerning solid waste, emphasis is laid on the sound environmental management of hazardous wastes and municipal wastes. Many universities abroad have set up courses of hazardous waste management, including management policy, methodology, technology, engineering and practices. Although a different course name is used here, the overall outlook is the same, including contents as follows.

1. Introduction on hazardous waste, including the history, important incidences and future endeavors of the hazardous waste management, and the definition, typology and sources of the hazardous waste.
2. The legal framework of hazardous waste management, including Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Stockholm Convention on Persistent Organic Pollutants, introduction on laws and regulations of hazardous waste management in EU, USA and China, and cutting-edge information about hazardous waste management.
3. Hazardous waste minimization and management plan, including hazardous waste minimization, waste exchange, project planning and audits.
4. Hazardous waste treatment methods, including physical chemical processes, biological methods, stabilization and solidification.
5. Hazardous waste facility development and operation, including facility types, facility operations, needs assessment, site selection, public participation, permitting.
6. Hazardous waste thermal treatment methods, including regulations, combustion, liquid injection incinerators, solid waste incineration, storage and feed systems, air pollution control, continuous emission monitors, trial burns, mobile systems.
7. Hazardous waste land disposal methods, including landfill operations, site selection, liner and leachate collection systems, cover systems, contaminant transport through landfill barriers, landfill stability, surface impo

**【Course Number】 80050333**

**【Course Title】 空气污染化学 Air Pollution Chemistry**

**【Credits】 3 【Semester】 spring**

**【Instructor】 Wang Yuxuan**

**【Brief Introduction】**

Every pollutant in the atmosphere undergoes many kinds of chemical processes in its formation,

transport, transformation, and removal. The course provides detailed discussions of chemical reactions and processes involved in the life cycle of many important air pollutants in the atmosphere, such as NO<sub>x</sub>, VOCs, O<sub>3</sub>, aerosols, acid rain, and mercury. The course covers chemical reactions not only in the gas phase, but also in the aerosol and aqueous phase, including also the so-called heterogenous reactions between different phases. The course teaches the chemical dynamics theories for the reactions and mathematical representations of them in chemical transport models that simulate air pollution. Through guided reading and discussions of recent academic papers, the students are expected to gain deep understanding of a number of important chemical processes critical for air pollution, the history how our knowledge about them is advanced through the years, and the research frontiers at present. The course gives several examples of the applications of air pollution chemistry theories in air quality research and management in China.

## **The Graduate Courses Taught in English in the Department of Computer Science and Technology**

**【Course Number】** 80240533

**【Course Title】** 人机交互技术 Human Computer Interaction Technology

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Shi Yuanchun

**【Brief Introduction】**

This course covers the basic understanding of human perception and cognition, interaction styles development, design and evaluation of GUI, and natural human computer interface technologies. Computer output mediums will include graphics, music, and 3-D sound. Input technologies are emphasized. Multimodality about visual, acoustic and touch sense channels are introduced with new input interfaces. Signal processing, feature extraction, and mapping schemes will also be covered. Measure methods are for the efficiency of interaction. Hands-on laboratories and independent projects, which can potentially continue as further researches.

**【Course Number】** 80240563

**【Course Title】** 下一代互联网 Future Internet Architecture

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Li Dan

**【Brief Introduction】**

The development of the Internet makes more and more students get interested in related technologies. The Internet is facing regeneration, and the key technologies of new generation Internet are in dire need

of spread. The course aims to enable students further understand and master the key technologies (including technical principles and specific realization) of new generation Internet after an overall understanding, and tentatively cultivate students' research ability in this field.

**【Course Number】 80240573**

**【Course Title】** Web 与信息检索 Web Information Retrieval

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Zhang Min

**【Brief Introduction】**

This course gives a survey to the new research branches, introduces the state-of-the-art technologies, and discusses on open problems and challenges on Web information retrieval (Web IR). At the same time, the course focuses on the real applications in the Internet environment, making case study and detail analysis on commercial search engines (SE). The main topics of the course includes (but not limited to): IR in Web environment, such as link analysis, anti-spam, etc; question answering; opinion / sentimental analysis; social media and IR; personalized IR and recommendation; user behavior analysis; online advertisement; mobile search; and IR and SE evaluations.

The course is composed of lectures and student-conducted discussions.

**【Course Number】 80240583**

**【Course Title】** 数据库技术 Database Technologies

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Zhou Lizhu

**【Brief Introduction】**

The content of the course consists of two parts: part 1 is the principles of database systems and their development method, and part 2 is the application development tools and hands-on practice. Part 1 includes data models, SQL language, database design methodology, storage and index, as well as transaction management and concurrency control. Part 2 includes Java programming for Web applications based on B/S architecture, and related lab works.

**【Course Number】 80240593**

**【Course Title】** 计算机图形学基础 Fundamentals of Computer Graphics

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Liu Yongjin

**【Brief Introduction】**

This course gives an introduction to computer graphics, by intergrating various skills in computer science such as programming, data structure and algorithm design. With the aid of new human-computer interface, students will learn these fundamental knowledges in computer science in terms of fancy graphics effects that reduce the learning load through abstract data visualization. The content of this course includes raster graphics, interactive graphics, matrix representation of 3D transformation, curve

and surface design, ray tracing and visual realism, all with OpenGL source code.

## **The Graduate Courses Taught in English in the Department of Automotive Engineering**

**【Course Number】** 70150163

**【Course Title】** 汽车机电系统 Mechatronic Systems in Automotive Engineering

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Li Jianqiu

**【Brief Introduction】**

**【Course Number】** 70150333

**【Course Title】** 汽车工程 II Automotive Engineering II

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Zheng Sifa

**【Brief Introduction】**

The contents in Automotive Engineering II include: 1) fundamentals requirements and analysis of vehicle vertical and lateral dynamics, excitation characteristic of the road, 2) structure and character of tires, components of suspension system and steering system; 3) single wheel model, single-track model, two-track model for vertical dynamics; 4) Single Track Vehicle Model, Four-Wheel Vehicle Model for lateral dynamics, 5) the influence of the parameters of tires, suspension system and steering system to the vehicle vertical and lateral dynamics.

**【Course Number】** 80150183

**【Course Title】** 内燃机 II Internal Combustion Engines II

**【Credits】** 3 **【Semester】** Spring

**【Instructor】** Wang Zhi

**【Brief Introduction】**

This course is suitable for the postgraduate students majored in Vehicle Engineering and Power machinery Engineering. The course mainly focuses on the working process of internal combustion engines, including gas exchange in internal combustion engine, gasoline engine and diesel engine combustion process, special combustion processes (such as HCCI, etc), supercharging for internal combustion engine, as well as the generation of pollutants formation and emission control.

## **The Graduate Courses Taught in English in the Department of Chemical Engineering**

**【Course Number】** 80340112

**【Course Title】** 表面科学与多相催化 Surface Science and Heterogeneous Catalysis

**【Credits】** 2 **【Semester】** Spring

**【Instructor】** Wang Dezheng

**【Brief Introduction】**

## **The Graduate Courses Taught in English in the School of Journalism and Communication**

**【Course Number】** 80670492

**【Course Title】** 高级英语财经新闻写作 Global Business Journalism (advanced)

**【Credits】** 2 **【Semester】** Spring

**【Instructor】** Zhou Nailing

**【Brief Introduction】**

**【Course Number】** 80670612

**【Course Title】** 英语特稿写作 Feature Writing in English

**【Credits】** 1 **【Semester】** Spring

**【Instructor】** Lee J.miller

**【Brief Introduction】**

**【Course Number】** 80670632

**【Course Title】** 跨文化传播 Intercultural Communication

**【Credits】** 2 **【Semester】** Spring

**【Instructor】** Shi Anbin

**【Brief Introduction】**

**【Course Number】** 80670781

**【Course Title】** 英语演讲 Public Speaking

**【Credits】** 1 **【Semester】** Spring

**【Instructor】** Fan Hong

**【Brief Introduction】**

This course includes four 4-hour sessions. The class is organized in the following structure:

- 1)Basic Principles for Public Speaking
- 2)Making Preparation for Your Presentation
- 3)Informative and Persuasive Presentation
- 4)Academic Presentation

## **The Graduate Courses Taught in English in the School of law**

**【Course Number】** 80661572

**【Course Title】** 中国与 WTO, Chinese Practice of WTO Law

**【Credits】** 2 **【Semester】** Spring

**【Instructor】** Lv Xiaojie

**【Brief Introduction】**

China's accession to the World Trade Organization (WTO) in 2001 has contributed greatly to the legal, social and economic transformation of China and is restructuring global markets and international trade law. This course outlines the main features of the Chinese legal system and analyses the impact of WTO accession on Chinese law and society. It focuses on a number of case studies, such as constitutional and administrative law, environmental law, intellectual property, food safety, anti-dumping and the regulation of international competition, and the relationship between international and national standards. We also use China's WTO experience to illustrate significant dilemmas of law today, such as conflicts between WTO law and national sovereignty and the role of developing countries in the WTO. The course considers all cases involving China in the WTO dispute settlement system and the future implications of Chinese participation in the WTO for the international trade regime and for Chinese law and society.

**【Course Number】** 80669162

**【Course Title】** 国际自然资源法 International Natural Resources Law

**【Credits】** 2 **【Semester】** Spring

**【Instructor】** Ge Xiangyang

**【Brief Introduction】**

International natural resources law regime, Chinese natural resources law and its practice, Current legal framework and practice of natural resources law in central Asia, Current legal framework and practice of natural resources law in Russia, Current legal framework and practice of natural resources law in Australia, Current legal framework and practice of natural resources law in Africa, legal practice of natural resources law by lawyers.