

## 课程详述

### COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	<b>课程名称 Course Title</b>	物理化学基础 <b>Physical Chemistry</b>
2.	<b>授课院系 Originating Department</b>	环境科学与工程学院 School of Environmental Science and Engineering
3.	<b>课程编号 Course Code</b>	ESE205
4.	<b>课程学分 Credit Value</b>	3
5.	<b>课程类别 Course Type</b>	专业基础课 Major Foundational Courses
6.	<b>授课学期 Semester</b>	春季 Spring
7.	<b>授课语言 Teaching Language</b>	中英双语 English & Chinese
8.	<b>授课教师、所属学系、联系方式 Instructor(s), Affiliation &amp; Contact</b> (For team teaching, please list all instructors)	唐圆圆、环境科学与工程学院, Email: <a href="mailto:tangyy@sustech.edu.cn">tangyy@sustech.edu.cn</a> Yuanyuan TANG, School of Environmental Science and Engineering, Email: <a href="mailto:tangyy@sustech.edu.cn">tangyy@sustech.edu.cn</a>
9.	<b>实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact</b>	待公布 To be announced
10.	<b>选课人数限额(可不填) Maximum Enrolment (Optional)</b>	

11. 授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other (Please specify)	总学时 Total
	40	8	0	0	48
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	高等数学 (Advanced Mathematics)				
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	本课程为环境科学与工程专业基础课, 水文与水资源工程学生也建议选修。 This fundamental course should be taken by students with contemplating in Environmental Science and Engineering, and is highly recommended to students majoring in Hydrology and Water Resources Engineering				
14. 其它要求修读本课程的学系 Cross-listing Dept.					

### 教学大纲及教学日历 SYLLABUS

#### 15. 教学目标 Course Objectives

该课程是通过物理的概念和方法来研究和理解化学体系的行为。本课程讨论化学热力学、简单的混合物体系、相变、化学和电化学平衡等。通过本课程的学习, 要求学生系统地掌握物理化学的基本原理和方法, 具备应用物理化学原理分析平衡态化学和电化学体系(包括能源转换与存储)基本问题及解决实际问题的能力, 加深对环境领域物理化学现象的理解及掌握, 为今后环境领域的相关研究提供扎实的理论基础。

The course is the study of macroscopic, atomic, subatomic and particulate phenomena in chemical systems in terms of laws and concepts of physics. This course subject deals with chemical thermodynamics, simple mixtures, phase diagrams, chemical equilibrium, equilibrium electrochemistry, statistical thermodynamics and chemical kinetics, etc. This course intends to teach students basic principles, laws and theories of physical chemistry that are necessary for chemistry, biology, materials, pre-medical, general science and engineering students, especially for those who will further conducted works in the related environmental research areas.

#### 16. 预达学习成果 Learning Outcomes

学生将通过对该课程的学习建立起基于物理的概念和方法来研究和理解化学体系行为的思想体系。通过学习学生将掌握热力学、混合体系、化学系统平衡、相变、电化学等基本问题的解决方法。

The course will help the students to build a theory system for studying and understanding the chemical system behaviours by the physics. The students completing the course will have ability to handle basic problems involving thermodynamics, chemical systems equilibrium, phase changes of chemical reactions.

#### 17. 课程内容及教学日历 (如授课语言以英文为主, 则课程内容介绍可以用英文; 如团队教学或模块教学, 教学日历须注明主讲人)

**Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)**

1. The properties of gases
2. The first law of thermodynamics
3. The second law of thermodynamics
4. Physical transformations of pure substances
5. Simple mixtures
6. Phase diagrams
7. Chemical equilibrium
8. Electrochemistry equilibrium

18. 教材及其它参考资料 Textbook and Supplementary Readings

教材

Required: P.W. Atkins, "Physical Chemistry", Seventh Edition (or latest), Oxford University Press, 2003.

Recommended: 傅献彩、沈文霞、姚天扬等. 物理化学 (上、下册) (第五版). 北京高等教育出版社, 2006;

参考资料:

物理化学学习指导, 第一版, 孙德坤, 高等教育出版社

课程评估 ASSESSMENT

19. 评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		5		
课堂表现 Class Performance		5		
小测验 Quiz		0		
课程项目 Projects		0		
平时作业 Assignments		20		
期中考试 Mid-Term Test		30		
期末考试		40		

<b>Final Exam</b>				
期末报告 <b>Final Presentation</b>		0		
其它（可根据需要 改写以上评估方 式） <b>Others (The above may be modified as necessary)</b>				

20. 记分方式 **GRADING SYSTEM**

- A. 十三级等级制 **Letter Grading**  
 B. 二级记分制（通过/不通过） **Pass/Fail Grading**

**课程审批 REVIEW AND APPROVAL**

21. 本课程设置已经过以下责任人/委员会审议通过  
**This Course has been approved by the following person or committee of authority**