

课程大纲 COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	ESE5010 高等环境化学 Advanced Environmental Chemistry
2.	课程性质 Compulsory/Elective	专业核心课
3.	课程学分/学时 Course Credit/Hours	3/48
4.	授课语言 Teaching Language	中文/英文
5.	授课教师 Instructor(s)	王辰
6.	先修要求 Pre-requisites	无
7.	教学目标 Course Objectives	
	<p>Advanced Environmental Chemistry is set for graduate students majoring in Environmental Science and Engineering and related subjects. The total hour is 48 h.</p> <p>The objectives of this course are to help students (1) master basic knowledge of environmental chemistry, such as chemistry of atmosphere, hydrosphere, soil and biosphere; and (2) learn how to apply basic theories and methods of chemistry to analyze environmental problems related to chemical substances, and to develop solutions for addressing the problems.</p> <p>高等环境化学是为环境科学与工程及相关专业的研究生设定的课程。总课时 48 小时。本课程的目标是（1）帮助学生掌握环境化学的基础知识，如大气化学，水圈，土壤和生物圈；（2）学习如何应用化学物质的基本理论和方法来分析与环境问题，并制定解决问题的解决方案。</p>	
8.	教学方法 Teaching Methods	
	<p>课堂教学与科研探讨，科技论文写作的形式相结合，注重培养学生综合应用知识的能力。</p> <p>Combination of classroom teaching and scientific research, study of scientific and technical papers, pay attention to cultivate students' comprehensive application of knowledge.</p>	
9.	教学内容 Course Contents	
	Section 1	<p>General introduction to environmental chemistry （小计：1 学时）环境化学介绍</p> <p>（1） The development of environmental chemistry globally （0.5 学时） 环境化学的发展</p> <p>（2） The objective, content and requirements of this course （0.5 学时） 课程目标、内容和要求</p>

Section 2	Atmospheric chemistry (小计: 15 学时) 大气化学 (1) Atmospheric structure and composition (2 学时) 大气结构与成分 (2) Stratospheric chemistry (2 学时) 平流层化学 (3) Tropospheric chemistry (3 学时) 对流层化学 (4) Indoor and outdoor air pollution (4 学时) 室内外大气污染 (5) Aerosol (2 学时) 大气颗粒物 (6) Air pollution measurement techniques (2 学时) 空气污染监测技术
Section 3	Energy and climate (小计: 6 学时) 能源与气候 (1) Energy and greenhouse effect (3 学时) 能源与温室效应 (2) Greenhouse gases and climate change (3 学时) 温室气体和气候变化
Section 4	Water and soil chemistry (小计: 12 学时) 水体和土壤化学 (1) Water chemistry basics (2 学时) 水化学基础 (2) Water acid-base chemistry (2 学时) 水体酸碱反应 (3) Water redox chemistry (2 学时) 水体氧化还原反应 (4) Water contaminants (2 学时) 水体污染 (5) Soil chemistry basics (4 学时) 土壤化学基础
Section 5	Environmental contaminants (小计: 4 学时) 环境污染物 (1) Organic contaminants (2 学时) 有机污染物 (2) Distribution and fate (2 学时) 污染物分布和迁移
Section 6	Presentation and Discussion (小计: 10 学时) 课程报告
10. 课程考核 Course Assessment	
课堂表现 (包括出勤) 10% + 作业 20% + 课程报告 30% + 期末考试 40% Course performance: 10%; Assignment 20%; Course presentation: 30%; Final exam: 40%.	
11. 教材及其它参考资料 Textbook and Supplementary Readings	
1、Environmental Chemistry, 5th Edition, Colin Baird and Michael Cann, 2012, W.H. Freeman & Co., N., ISBN-10: 1429277041 2、《环境化学》，戴树桂，2006，高等教育出版社，ISBN: 9787040199567 3、Environmental Organic Chemistry, 2nd Edition, Rene P. Schwarzenbach, Philip M. Gschwend and Dieter M. Imboden, 2003, John Wiley & Sons, Inc., Publication, ISBN: 0-47 1-35750-2 4、《环境有机化学》，王连生译，2004，化学工业出版社，ISBN: 9787502547943	