

## 课程大纲 COURSE SYLLABUS

1.	<b>课程代码/名称 Course Code/Title</b>	<b>ESE5010 高等环境化学 Advanced Environmental Chemistry</b>
2.	<b>课程性质 Compulsory/Elective</b>	专业选修课
3.	<b>课程学分/学时 Course Credit/Hours</b>	3/48
4.	<b>授课语言 Teaching Language</b>	中文/英文
5.	<b>授课教师 Instructor(s)</b>	王俊坚
6.	<b>先修要求 Pre-requisites</b>	无
7.	<b>教学目标 Course Objectives</b>	
	<p>Advanced Environmental Chemistry is set for the graduates who major in Environmental Science and Engineering. It is a compulsory course and total hour is 48.</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专业的研究生课程设定的。必修课程，总时间是 48 小时。</p> <p>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.	<b>教学方法 Teaching Methods</b>	
	<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.	<b>教学内容 Course Contents</b>	
	<b>Section 1</b>	<p>General introduction to environmental chemistry （小计：1 学时）</p> <p>环境化学介绍</p> <p>（1） The development of environmental chemistry globally （0.5 学时）</p> <p>环境化学的发展</p> <p>（2） The objective, content and requirements of this course （0.5 学时）</p> <p>课程目标、内容和要求</p>

<b>Section 2</b>	<p>Atmospheric chemistry (小计: 9 学时) 大气化学</p> <p>(1) Atmospheric structure (1 学时) 大气结构</p> <p>(2) Atmospheric composition (1 学时) 大气成分</p> <p>(3) Air pollution (2 学时) 大气污染</p> <p>(5) Climate (2 学时) 气候</p> <p>(6) Stratospheric ozone depletion (2 学时) 平流层臭氧损耗</p> <p>(7) Water in the atmosphere-Acid rain (1 学时) 酸雨</p>
<b>Section 3</b>	<p>Hydrospheric chemistry (小计 14 学时) 水化学</p> <p>(1) Water chemistry basics (2 学时) 水化学基础</p> <p>(2) Colloids (2 学时) 胶体</p> <p>(3) Adsorption and reaction at surfaces (2 学时) 吸附</p> <p>(4) Oxidation and reduction (3 学时) 氧化还原</p> <p>(5) Dispersions (1 学时) 扩散</p> <p>(6) Dissolution and precipitation (2 学时) 溶解于沉淀</p> <p>(7) Endocrine disruptors in water (2 学时) 水中的激素干扰物</p>
<b>Section 4</b>	<p>Soil chemistry (小计 12 学时) 土壤化学</p> <p>(1) Soil Structure and Components (2 学时) 土壤结构与成分</p> <p>(2) Soil properties (2 学时) 土壤性质</p> <p>(3) Heavy metals in soil (4 学时) 土壤中的重金属</p> <p>(4) Agricultural chemicals in soil (2 学时) 土壤中的农业化学品</p> <p>(5) Soil remediation (2 学时) 土壤修复</p>
<b>Section 5</b>	<p>Biospheric chemistry (小计 2 学时) 生物圈化学</p> <p>(1) Bioaccumulation of pollutants (1 学时) 污染物的生物富集</p> <p>(2) Chemical contaminants and ecotoxicology (1 学时) 化学污染物的生理毒性</p>
<b>Section 6</b>	<p>Presentation and Discussion (小计 10 学时) 做演讲与报告</p>
<b>10. 课程考核 Course Assessment</b>	
<p>演讲 50%+期末报告 50%, Course presentation: 50%, final report: 50%.</p>	
<b>11. 教材及其它参考资料 Textbook and Supplementary Readings</b>	
<p>1、《环境化学》，戴树桂，1997，高等教育出版社，ISBN: 9787040199567。</p> <p>2、国家自然科学基金委员会化学科学部编，《环境化学学科前沿与展望》，科学出版社，2011，第1版。</p> <p>3、Chemistry of the Environment, Thomas G. Spiro, Kathleen Purvis-Roberts, William M. Stigliani, 2011, University Science Books, U.S.; 3rd Revised edition, ISBN: 189138970X</p>	