

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.	课程名称 Course Title	污染物运移过程 Environmental Transport Process		
2.	授课院系 Originating Department	环境科学与工程学院 School of Environmental and Engineering		
3.	课程编号 Course Code	ESE406		
4.	课程学分 Credit Value	3		
5.	课程类别 Course Type	专业选修课 Major Elective Courses		
6.	授课学期 Semester	秋季 Fall		
7.	授课语言 Teaching Language	中英双语 English & Chinese		
8.	授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师） Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	教师 Name	所属学系 Dep.	联系方式 Phone
		刘崇炫 Chongxuan Liu	环境科学与工程学院 School of Environmental and Engineering	18928464396
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	汪伊 Yi Wang 环境科学与工程学院 School of Environmental and Engineering, 18358514297		
10.	选课人数限额(可不填) Maximum Enrolment (Optional)			

11. 授课方式 Delivery Method	讲授	习题/辅导/讨论	实验/实习	其它(请具体注明)	总学时
	Lectures	Tutorials	Lab/Practical	Other (Please specify)	Total
学时数 Credit Hours	44	4	0	0	48
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	先选课 Co-requisites: 高等数学 Calculus, 物理化学 Physical Chemistry				
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	无 N/A				
14. 其它要求修读本课程的学系 Cross-listing Dept.	无 N/A				

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

1. 认识不同环境系统中控制污染物运移的主要过程；2. 获取如何概化环境系统和定量描述污染物运移过程的知识；3. 掌握如何简化污染物运移的数学问题用以分析和预测污染物在环境中运移的技能。

The objectives of the course are for students to: 1) develop understanding of major environmental processes controlling contaminant transports in natural and engineered environmental systems; 2) obtain knowledge to conceptualize environmental systems for facilitating quantitative descriptions of environmental transport processes; and 3) learn how to simplify mathematical problems for analyzing and predicting contaminant transport in environments.

16. 预达学习成果 Learning Outcomes

通过本课程的学习，学生将了解污染物在环境中的运移现象和控制污染物运移的机制，能够进行模型概化和参数估算，能够运用所学知识分析和预测污染物在环境中的分布和对环境的影响。

Through the learning of the course, students will understand contaminant transport phenomena and fundamentals in environmental systems, can conceptualize the environmental systems and perform parameter estimation, and can analyze and predict contaminant distribution and its impacts to environment.

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.)

序号 NO.	目录 Content	学时 class hours
1	绪论 (Introduction): Overview of environmental transport processes	2
2	扩散运移过程(Diffusive Transport Process) : Diffusion phenomena, theory, and coefficients	6
3	对流扩散运移过程 (Advection and Diffusion): Mass balance equations, simplification, mathematical solutions, and applications.	6
4	传质过程 (Mass Transfer Processes): Mass transfer phenomena, theory, coefficients and applications.	4
5	对流弥散运移 (Advection and Dispersion): Dispersion phenomena, theory, coefficients; mathematical solutions to advective dispersion equations and applications	6
6	期中考试 (Mid-term Examination)	2
7	平衡和分配过程 (Equilibrium and Partitioning Processes): Equilibrium species transfer between different phases, partitioning theory and coefficients	2
8	传质和动力学耦合过程 (The Coupling of Mass Transfer and Kinetics) : Mass transfer-limited homogeneous, heterogeneous, and biological reactions	6
7	河流、湖泊、海洋中污染物的运移过程 (Contaminant transport in rivers, lakes, oceans): Mixing theories, coefficients, time scales, and transport.	3
8	土壤和地下水中污染物的运移过程 (Contaminant Transport in Soil and Groundwater): Mechanical dispersion, contaminant retardation, remediation and long-term tailing.	3
9	胶体和颗粒运移过程 (Colloidal and Particle Transport): Colloidal stability and aggregation, particle sedimentation and transport in surface water systems, particle filtration theory and transport in porous media.	6
10	复习 (Review and Exercise)	2
Total		48

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

《Environmental Transport Process》 Second Edition by Bruce E. Logan

《Diffusion: Mass Transfer in Fluid Systems》 Second Edition by E. L. Cussler



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		10%		
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments		20%		
期中考试 Mid-Term Test		30%		
期末考试 Final Exam		40%		
期末报告 Final Presentation		-		
其它（可根据需要 改写以上评估方式） Others (The above may be modified as necessary)		-		

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