ESE336 课程大纲

南方科技大学
SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

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**	**环境分析化学 Environmental Analytical Chemistry**
2.	**授课院系 Originating Department**	环境学院 College of Environmental Science and Engineering
3.	**课程编号 Course Code**	ESE336
4.	**课程学分 Credit Value**	3
5.	**课程类别 Course Type**	限选课 **（请保留相应选项 Please only keep the relevant information）**
6.	**授课学期 Semester**	春季 Spring
7.	**授课语言 Teaching Language**	中文 Chinese **（请保留相应选项 Please only keep the relevant information）**
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）**	张斌田，环境学院，zhangbintian@sustech.edu.cn Dr. Bintian Zhang, CESE
9.	**实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact**	待公布 To be announced **（请保留相应选项 Please only keep the relevant information）**
10.	**选课人数限额(可不填) Maximum Enrolment （Optional）**	

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
	学时数 Credit Hours	48	0	0	0	48

12.	先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	无
13.	后续课程、其它学习规划 Courses for which this course is a pre-requisite	
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

分析化学是环境、材料、化学及生物等专业的基础课程，本课程包括经典的化学定量分析及基础仪器分析两部分内容，包括分析化学的基础知识、基本原理及操作、酸碱平衡及滴定、络合滴定、重量分析及沉淀滴定、环境样品前处理、光谱分析方法、原子光谱法、电位分析法、氧化还原及电位滴定、伏安法分析和电化学传感器、电泳技术。通过本课程的学习使得学生系统地掌握分析化学的基本原理和方法，具备应用分析化学的基本技能对实际样品进行定性和定量分析的能力，培养解决实际环境分析问题的技巧。

Analytical chemistry is a foundational course for undergraduates who majored in environmental science and engineering. This course includes classical chemical quantitative analysis and basic instrumental analysis, with major content of basic knowledge and principle in analytical chemistry, acid-base equilibria and titrations, complexometric reactions and titrations, gravimetric analysis and precipitation equilibria, precipitation reactions and titrations, preparation of environmental samples, spectrochemical methods, atomic spectrometry methods, potentiometry, redox and potentiometric titration, voltammetry and electrochemical sensors and electrophoresis. This course is intended to provide the students with an understanding of basic analytical principles and instrumentations that are important in environmental science, biology, chemistry, material science, etc.

16. 预达学习成果 Learning Outcomes

该课程将帮助学生掌握分析化学的基本原理和操作，培养解决实际分析问题的能力。通过本课程的学习，初步具备选择正确的分析方法、准确评价和表达分析结果的能力，建立定性分析和定量分析的概念。

This course will help the students master the basic principle and operation in analytical chemistry, develop the ability of solving practical analytical problems. Through the study of this course, students will be able to select an appropriate analytical method, precisely evaluate and express the analytical results, and eventually build the concepts of qualitative analysis and quantitative analysis.

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. 分析化学基础及前言 Introduction to analytical chemistry 2 hrs

2. 分析化学的基本实验工具及操作 Basic tools and operations of analytical chemistry 3 hrs

3. 酸碱平衡及酸碱滴定 Acid-base equilibria and titrations 3 hrs

4. 络合反应及络合滴定 Complexometric reactions and titrations 3 hrs

5. 重量分析及沉淀平衡 Gravimetric analysis and precipitation equilibria 3 hrs

6. 沉淀反应及滴定 Precipitation reactions and titrations 3 hrs

7. 环境样品前处理 Enviromental sample preparation: solvent and solid-phase extraction 3 hrs

8. 期中报告 Mid-term thesis 2 hrs

9. 光谱分析方法 Spectrochemical methods 3 hrs

10. 原子光谱法 Atomic spectrometric methods 3 hrs

11. 电化学电池及电极电位 Electrochemical cells and electrode potentials 3 hrs

12. 电位分析法 Potentiometric electrodes and potentiometry 3 hrs

13. 氧化还原及电位滴定 Redox and potentiometric titrations 3 hrs

14. 伏安分析法及电化学传感器 Voltammetry and electrochemical sensors 3 hrs

15. 电泳技术 Electrophoresis 3 hrs

16. 期末报告 Final Presentation 3 hrs

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

"Analytical chemistry" by Gary D. Christian, 7th edition, University of Washington

“分析化学（上、下册）” 武汉大学，（第五版），高等教育出版社，2006

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		20		
课堂表现 Class Performance		n/a		
小测验 Quiz		n/a		
课程项目 Projects		n/a		
平时作业 Assignments		20		
期中考试 Mid-Term Test		n/a		
期末考试 Final Exam		n/a		
期末报告 Final Presentation		60		
其它（可根据需要改写以上评估方式） Others (The above may be modified as necessary)		n/a		

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

课程详述

COURSE SPECIFICATION

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5.	**课程类别 Course Type**	专业核心课 Major Core Courses **（请保留相应选项 Please only keep the relevant information）**
6.	**授课学期 Semester**	春季 Spring
7.	**授课语言 Teaching Language**	中英双语 English & Chinese **（请保留相应选项 Please only keep the relevant information）**
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）**	张斌田，环境学院，zhangbintian@sustech.edu.cn Dr. Bintian Zhang, CESE
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14. 伏安分析法及电化学传感器 Voltammetry and electrochemical sensors 3 hrs

15. 电泳技术 Electrophoresis 3 hrs

16. 总结与答疑 Summary and discussion, Q&A 3 hrs

17. 期末考试 Final Exam 2 hrs

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

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课程评估 ASSESSMENT

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	出勤 Attendance		10		
	课堂表现 Class Performance				
	小测验 Quiz				
	课程项目 Projects				
	平时作业 Assignments		10		
	期中考试 Mid-Term Test		20		
	期末考试 Final Exam		60		
	期末报告 Final Presentation		n/a		
	其它（可根据需要改写以上评估方式） Others (The above may be modified as necessary)		n/a		

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