

## 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 <b>Course Title</b>	分析化学 <b>Analytical Chemistry</b>				
2.	授课院系 <b>Originating Department</b>	化学系 Department of Chemistry				
3.	课程编号 <b>Course Code</b>	CH205				
4.	课程学分 <b>Credit Value</b>	4				
5.	课程类别 <b>Course Type</b>	专业基础课 Major Foundational Courses				
6.	授课学期 <b>Semester</b>	秋季 Fall				
7.	授课语言 <b>Teaching Language</b>	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) <b>Instructor(s), Affiliation &amp; Contact</b> (For team teaching, please list all instructors)	田瑞军副教授, 化学系 Email: tian.rj@sustc.edu.cn Dr. Ruijun Tan, Associate Professor, Department of Chemistry Email: tian.rj@sustech.edu.cn 谢小江副教授, 化学系 Dr. Xiaojiang Xie, Associate Professor, Department of Chemistry Email: xiexj@sustech.edu.cn				
9.	实验员/助教、所属学系、联系方式 <b>Tutor/TA(s), Contact</b>	无 NA				
10.	选课人数限额(可不填) <b>Maximum Enrolment (Optional)</b>					
11.	授课方式 <b>Delivery Method</b>	讲授 <b>Lectures</b>	习题/辅导/讨论 <b>Tutorials</b>	实验/实习 <b>Lab/Practical</b>	其它(请具体注明) <b>Other (Please specify)</b>	总学时 <b>Total</b>
	学时数 <b>Credit Hours</b>	54	10	0	复习、考试 (2周) Revision & Exam (2 weeks)	64

12. 先修课程、其它学习要求 <b>Pre-requisites or Other Academic Requirements</b>	化学原理 A (CH101A)
13. 后续课程、其它学习规划 <b>Courses for which this course is a pre-requisite</b>	本课程为化学, 化工和材料系的专业基础课, 生物系的学生也建议选修。 This fundamental course should be taken by students with contemplating in Chemistry, Chemical Engineering, and Materials Science and Engineering, etc. and is highly recommended to students in Biology, and Medical Science.
14. 其它要求修读本课程的学系 <b>Cross-listing Dept.</b>	无 NA

### 教学大纲及教学日历 SYLLABUS

#### 15. 教学目标 Course Objectives

本课程包括经典的定量分析及仪器分析两部分内容, 由样品的前处理, 分析化学的基础知识及基本操作、化学分析法、电化学分析法、质谱、色谱分析法、光学光谱法等部分构成。通过本课程的学习要求学生系统地掌握分析化学的基本原理和方法, 加深对其它化学课程内容的理解, 并具备应用分析化学的基本原理对实际样品进行定性和定量分析, 以及解决实际分析问题的能力。

This course including classical quantitative analysis and instrumental analysis consists of sample preparation, chemical analysis, electrochemical methods, chromatography methods, spectrochemical methods, mass spectrometry, etc. This course is intended to provide students with an understanding of basic principles and theories of analytical chemistry that are necessary for chemistry, biology, materials, medical, and engineering students.

#### 16. 预达学习成果 Learning Outcomes

该课程将帮助学生提高对分析化学相关样品前处理和各种分离、检测方法的了解和认识, 并对相关的定性和定量分析有深入地理解。

The course will help students develop the ability to handle basic problems involving sample preparation and analysis (including qualitative 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. Introduction and Advances of Analytical Chemistry 分析化学基础及前言介绍 4 hrs
2. Statistics and Data Handling in Analytical Chemistry 分析化学数据及统计分析 6 hrs
3. Basic Tools and Operations of Analytical Chemistry 分析化学的基本实验设备及操作 4 hrs
4. Sample Preparation: Solvent and Solid-Phase Extraction 样品前处理 2 hrs
5. Chromatography: Principles and Theory 色谱原理 6 hrs
6. Gas Chromatography 气相色谱 2 hrs
7. Liquid Chromatography and Electrophoresis 液相色谱及电泳 4 hrs
8. Mass Spectrometry 质谱 4 hrs
- Mid-term Presentation and Thesis 期中论文及报告 4 hrs
9. Spectrochemical Methods 光谱分析方法绪论 2hrs
10. Atomic Spectrometric Methods 原子光谱法 2hrs
11. Acid-Base Equilibria 酸碱平衡 4 hrs
12. Complexometric Reactions and Titrations 络合反应及络合滴定 4 hrs
13. Gravimetric Analysis and Precipitation Equilibria 重量分析及沉淀平衡 2hrs
14. Precipitation Reactions and Titrations 沉淀反应及滴定 2hrs
15. Electrochemical Cells and Electrode Potentials 电化学池及电极电位 4 hrs
16. Potentiometric Electrodes and Potentiometry 电位法分析 4 hrs
17. Redox and Potentiometric Titrations 氧化还原及电位滴定 2 hrs
18. Voltammetry and Electrochemical Sensors 伏安法分析及电化学传感器 2 hrs

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

Required: Christian, Gary D., author. Analytical chemistry. -- Seventh edition / Gary D. Christian, University of Washington, Purnendu K. (Sandy)

Recommended: 武汉大学, 分析化学(上、下册)(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		2		

课堂表现 Class Performance	2		
小测验 Quiz	2		
课程项目 Projects	2		
平时作业 Assignments	2		
期中考试 Mid-Term Test	25		
期末考试 Final Exam	65		
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		

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

化学系教学指导委员会  
Teaching committee of the chemistry department