

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	现代策略合成 Modern Strategic Synthesis				
2.	授课院系 Originating Department	化学系 Department of Chemistry				
3.	课程编号 Course Code	CH311				
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)	刘心元, 教授, 化学系 Liu Xin-Yuan, Full Professor, Chemistry Liuxy3@sustech.edu.cn				
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	待公布 To be announced				
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	60				
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				48

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	有机化学 II (CH206), 金属有机化学 (CH214), 配位化学 (CH215)
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

进一步加深和掌握化学专业基础课有机化学的有机反应的知识; 了解和掌握很多重要基元有机反应中涉及到选择性(化学、区域、立体选择性)以及反应机理; 同时掌握金属催化剂和有机小分子催化剂参与的有机反应的反应机理和立体选择性控制; 初步了解有机合成的策略和设计。

The primary objectives of this course are related to the fundamentals of synthetic design and strategy in organic synthesis. It helps students to know what should be considered in having a more selective reaction outcomes by using organometallic or organic catalysts/reagents. At the same time, to let the students to learn the related mechanistic aspects (chemo, regio, stereoselectivity); and to let them know better how to design their own experiments.

16. 预达学习成果 Learning Outcomes

本课程以从有机反应的选择性以及反应的机理反应了解和掌握这种有机基元反应, 同时阐释这些基元反应在有机合成的应用范围及其局限性; 同时讲解金属催化剂以及不同类型有机催化剂催化的重要有机反应的反应机理和立体选择性的控制; 也要讲解这些催化剂在有机合成的应用, 初步了解有机合成的策略和设计。让学生进一步加深和掌握基础有机化学的有机反应的知识; 特别是让学生通过这个课程可以很好的灵活运用不同类型的有机反应, 可以为进入化学实验室开展科研工作研究打下坚实基础和充分准备。

The students are expected to understand the use and mechanisms of certain functional groups in advanced organic synthesis and applications, aware the scope of their applications and limitations, and know the basis of those controls and criterion for the observed selectivity; and understand the basic idea on how to design an experiments to achieve the desired outcome and selectivity. The students will be prepared better for upcoming research tasks out of this.

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.)

主要内容包括:

1. introduction of advanced organic chemistry 高等有机化学导论 (2 课时)

Historical background of organic synthesis and the future of organic synthesis will be introduced.

本节主要介绍有机化学发展历史和有机化学将来发展方向。

2. Selectivity, terminology, synthetic strategy (retrosynthesis) 选择性、化学术语、逆合成分析策略 (10 学时)

In this chapter, selectivity (including chemo-, regio- and stereochemistry) will be in detail discussed. Second, some of terminology will be introduced. Finally, synthetic strategy for the total synthesis will be discussed in detail.

本章介绍有机反应选择性 (包括化学、区域特别是立体选择性)、一些化学术语、全合成中逆合成分析策略。

3. Redox in organic synthesis (Oxidation chemistry and reduction chemistry) 有机化学氧化还原反应 (14 学时)

In this chapter, oxidation and reduction chemistry (including different reagents and selectivity) will be in detail discussed.

本章详细介绍有机合成化学中非常重要的氧化还原反应, 包括不同试剂和选择性问题。

4. Enolates and enamines in organic synthesis (Aldol, Mannich, Michael reactions) 烯醇和烯胺在有机化学中应用 (12 学时)

The selectivity, mechanism and application of Enolates and enamines in organic synthesis (Aldol, Mannich, Michael reactions) will be in detail discussed.

本章详细介绍烯醇和烯胺在有机化学中应用, 选择性问题和详细的机理探讨。

5. Pericyclic reactions in organic synthesis 周环反应应用 (8 学时)

Pericyclic reactions in organic synthesis will be in detail discussed.

本章介绍周环反应及其在有机化学中应用。

6. Natural product, Medicine, advanced material synthesis 这些策略在新材料及药物研发的应用、近年具突破性的技术等等 (2 学时)

Natural product, Medicine, advanced material synthesis will be discussed.

本章简单介绍这些策略在新材料及药物研发的应用、近年具突破性的技术等等。

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

Carey, F. A.; Sundberg, R.J. Advanced Organic Chemistry Part A and B 4th ed. Plenum Press, 2000.

Kurti, L. and Czako, B. "Strategic Applications of Named Reactions in Organic Synthesis" ISBN:978-0124297852

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				
课堂表现 Class Performance		50		
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam		50		
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

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