

## 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>	不对称合成 <b>Asymmetric Synthesis</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>	CH314				
4.	课程学分 <b>Credit Value</b>	3				
5.	课程类别 <b>Course Type</b>	专业选修课 Major Elective Courses				
6.	授课学期 <b>Semester</b>	春季 Spring				
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)	谭斌 化学系 88010315 TAN, Bin (Dept of Chem) 刘心元 化学系 88010314 LIU, Xin-Yuan (Dept of Chem)				
9.	实验员/助教、所属学系、联系方式 <b>Tutor/TA(s), Contact</b>	待公布 To be announced				
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>	48				48

12. 先修课程、其它学习要求 <b>Pre-requisites or Other Academic Requirements</b>	有机化学 II (CH206), 现代策略合成 (CH311)
13. 后续课程、其它学习规划 <b>Courses for which this course is a pre-requisite</b>	
14. 其它要求修读本课程的学系 <b>Cross-listing Dept.</b>	

### 教学大纲及教学日历 SYLLABUS

#### 15. 教学目标 **Course Objectives**

不对称合成是当代有机化学研究的热点和前沿, 通过本课程的学习, 帮助学生了解和掌握有机化学或药物合成反应中立体化学的基本知识, 进一步学习有关不对称合成反应的基本概念、不对称合成的方法学及手性药物合成的策略, 并且了解近年来不对称合成的研究成就和发展前沿, 为科学研究打下坚实基础。

Asymmetric organic synthesis is one of hot research fields in the field of organic synthesis in recent years. The primary objectives of this course are related to the fundamentals of stereochemistry and asymmetric strategies and tactics in organic synthesis and wide application in natural products, medicine and advanced material synthesis.

#### 16. 预达学习成果 **Learning Outcomes**

本课程以基本催化不对称类型-金属催化、有机催化、酶催化为线索, 分别讲解不对称合成单元反应的原理, 方法和机制。结合最新文献中对相关反应的研究进展和在药物合成中的应用。使学生对不对称的发展、现状及其应用有全面的了解。另外, 可以激发学生从事不对称合成的热情, 为我国的新药研发贡献自己的力量。

Several main points will be involved: To gain an appreciation of different types of asymmetric reactions which may be employed in organic synthesis; To understand the origins of the enantioselectivities and the mechanisms of the reactions; To be able to propose asymmetric syntheses of organic molecules of medium complexity; To carry up the most recent development in asymmetric catalysis. Therefore, the students can engage in asymmetric synthesis with great enthusiasm and make a great contribution to new drug research and development.

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.)**



Part I: Asymmetric Organocatalysis

Chapter 1. Brief introduction/ 2 credit hours

Chapter 2. Aminocatalysis/ 4 credit hours

Chapter 3. Hydrogen-bonding catalysis/ 4 credit hours

Chapter 4. Phase transfer catalysis/ 4 credit hours

Chapter 5. Nucleophilic catalysis/ 2 credit hours

Chapter 6. Organocatalytic domino reactions/ 2 credit hours

Chapter 7. Application in total synthesis/ 4 credit hours

Part II: Asymmetric Organometallic Catalysis

Chapter 1. Chiral phosphorus ligands in asymmetric catalysis/ 4 credit hours

Chapter 2. Chiral oxazoline-containing ligands in asymmetric catalysis/ 4 credit hours

Chapter 3. Chiral Olefin/diene ligands in asymmetric catalysis/ 4 credit hours

Chapter 4. Chiral salen ligands in asymmetric catalysis/ 2 credit hours

Chapter 5. Chiral N-heterocyclic carbene ligands in asymmetric catalysis/ 4 credit hours

Chapter 6. Asymmetric cooperative catalysis/ 4 credit hours

Part III: Students presentation/ 4 credit hours

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

Catalytic Asymmetric Synthesis, 3rd Edition, Iwao Ojima (Editor)

ISBN: 978-0-470-17577-4, 2010.

林国强等编. 手性合成—不对称反应及其应用. 北京: 科学出版社. 2013 年第五版

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				
课堂表现 Class Performance		10		
小测验 Quiz		50		

课程项目 <b>Projects</b>			
平时作业 <b>Assignments</b>	20		
期中考试 <b>Mid-Term Test</b>			
期末考试 <b>Final Exam</b>			
期末报告 <b>Final Presentation</b>	20		
其它（可根据需要 改写以上评估方 式） <b>Others (The above may be modified as necessary)</b>			

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

