

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	有机功能材料 Functional Polymers				
2.	授课院系 Originating Department	材料科学与工程系 Department of Materials Science and Engineering				
3.	课程编号 Course Code	MSE325				
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 Fall				
7.	授课语言 Teaching Language	英语 English				
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)	王湘麟 讲座教授，材料科学与工程系 Prof. Wang Hsianglin, Dept. of Materials Science and Engineering, South University of Science and Technology of China 0755-88018948 wangxl@sustc.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)	20				
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	
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**

This class introduces the broad field of functional materials and their applications to the undergraduate students. It is designed for undergraduate students who have been exposed to organic/polymer chemistry, physics as well as materials science, and wish to have a basic understanding of functional organic materials. The main purpose is to reveal basic concepts and general knowledge associated with the synthesis and applications of organic materials with bioscience, energy and sensing applications; clearly elucidate structure and function relationships, and to employ various characterization techniques to determine materials structure and order at various length scale.

Interactions between organic molecules involves pi-pi, dipole-dipole, H-bonding and electrostatic interactions can lead to hierarchical structure by way of self-assembly. Organic functional materials possess structure-dependent functions with advanced applications often have hierarchical structure across multiple length scales. In this course, we will introduce the underpinning mechanisms of organic molecule self-assembly and how experimental parameters impact the hierarchical structure hence functions of supramolecular structures.

16. **预达学习成果 Learning Outcomes**

After finishing this class, the students are expected to be familiar with the synthesis and applications of organic materials. The student will have entry level knowledge on the design principle of functional materials and the frontier research topics in organic materials. The students will learn to perform literature search, develop understanding of recent advances in organic materials. Through critical thinking, the students will develop the ability to appreciate the basic science and applications beyond the scope of organic materials.

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.)

Lecture 1: 有机材料总论 (3 学时) Introduction of organic materials (3 Credit hours)
Lecture 2: 小分子材料 (6 学时) Small molecules materials (6 Credit hours)
Lecture 3: 高分子概论 (6 学时) Brief introduction of polymers (6 Credit hours)
Lecture 4: 有机与高分子材料的化学合成 (6 学时) Synthesis of organic and polymeric materials (6 Credit hours)
Lecture 5: 高分子功能材料 (6 学时) Functional polymeric materials (6 Credit hours)
Lecture 6: 有机锂离子电池 (3 学时) Organic lithium battery (3 Credit hours)
Lecture 7: 有机太阳能电池 (6 学时) Organic solar cells (6 Credit hours)
Lecture 8: 有机传感器 (6 学时) Sensors (6 Credit hours)
Lecture 9: 学术讨论 (6 学时) Discussion (6 Credit hours)

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

The reference readings are composed of the annual reports of the worldwide reputable research centers (UNSW ARC, NREL, Fraunhofer Institute and etc.) popular and updated literatures and supplementary books (Applied Photovoltaics, Practical Handbook of Photovoltaics Fundamentals and Applications, etc.)

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		10		
课堂表现 Class Performance		10		
小测验 Quiz				
课程项目 Projects		10		
平时作业 Assignments				
期中考试 Mid-Term Test		25		
期末考试 Final Exam		35		
期末报告 Final Presentation		10		
其它 (可根据需要 改写以上评估方式) Others (The above may be modified as				

necessary)

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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

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