

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	有机电子学概论 Introduction to Organic Electronic and Optoelectronic Materials and Devices
2.	授课院系 Originating Department	化学系 Department of Chemistry
3.	课程编号 Course Code	CH408
4.	课程学分 Credit Value	2
5.	课程类别 Course Type	专业选修课 Major Elective Courses
6.	授课学期 Semester	春季 Spring
7.	授课语言 Teaching Language	英文 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)	许宗祥, 副教授, 化学系 第一科研楼 408 室 Xu.zx@sustc.edu.cn 0755-88018310 Xu Zongxiang, Associate Professor, Department of Chemistry Rm.408, Academic Research Building 1 0755-88018310
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	无 NA
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	30

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	32	NA	NA	NA	32

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	有机化学 II (CH206)
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

本课程的主要目的是通过讲解和讨论有机分子以及有机固体材料的光电过程与特性，深入认识有机材料的光电性质，从而为这些材料在有机光电器件的应用打下基础。课程的另一个目的是将具有不同光电特性的有机材料应用于机薄膜器件，如：有机场效应晶体管、基于有机电致发光的信息显示与照明、基于有机光伏的太阳能电池、有机传感器、有机存储器及有机激光等。通过器件机理和性能的阐述，理解有机功能材料在各种光电器件中的应用原理及相关光电子过程与规律。

1) To grasp the mechanisms governing the generation, transportation and interaction of excitons and charge carriers in organic materials. Here, electronic structure of a single organic molecule is used as a guide to the electronic behavior of organic aggregate structures.

2) Meanwhile, to understand the structure and working principles of several practical organic optoelectronic devices. Emphasis is placed on the function of organic thin films as active component in the devices including OLEDs, OPVs, OFETs, organic lasers, organic memory and organic sensor, as well as the involved electronic processes.

16. 预达学习成果 Learning Outcomes

基本要求：通过本课程的学习，要求学生全面掌握有机材料的光电特性及其本质，包括能级特征、堆叠模式、电子过程、能量过程、以及有机薄膜的制备及表征。其次，对基于有机材料的光电器件中的科学知识有一定的了解。

Requirement: After course study, students are required to grasp the basic science and knowledge in the aspects of organic functional materials, familiar with their common properties and applications. In the mean time, the working principle of corresponding devices is required to know.

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.)

Week 1-2, Introduction to organic electronic materials and devices

Week 3-5, Electronic structure and process of organic materials

Week 6-7, Organic Field-Effect Transistors (OFET) (Memory, Sensor)

Week 8-9, Organic Photovoltaic Cells (OPV)

Week 10-11, Organic Light-Emitting Diodes (OLED)

Week 12-14, Organic Semiconducting Materials for Perovskite Solar Cell

Week 15, Other Optoelectronic Devices

Week 16, Final presentation

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

教材：自编

参考资料：

Sam-Shajing Sun, Larry R. Dalton, 《Introduction to Organic Electronic and Optoelectronic Materials and Devices》, CRC Press

刘云圻, 《有机纳米与分子器件》, 科学出版社, 第一版 (2010年5月)

王菝梅, 叶常青, 《有机光电材料与器件》, 化学工业出版社; 第1版 (2013年9月1日)

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		20		
课程项目 Projects		0		
平时作业 Assignments		0		
期中考试 Mid-Term Test		0		
期末考试 Final Exam		0		

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)	0		

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

