

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	生物材料实验 Biomaterial Experiment
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	MSE340
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)	廖成竹，材料科学与工程系，电子邮箱：liaocz@sustc.edu.cn 李慧丽，材料科学与工程系，电子邮箱：lihli@sustc.edu.cn Chengzhu Liao, Department of MSE, Email: liaocz@sustc.edu.cn Huili Li, Department of MSE, Email: lihuli@sustc.edu.cn
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)	无 NA

11. 授课方式 Delivery Method	讲授	习题/辅导/讨论	实验/实习	其它(请具体注明)	总学时
	Lectures	Tutorials	Lab/Practical	Other (Please specify)	Total
学时数 Credit Hours	10	0	54		64

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	MSE207 材料科学基础 MSE207 Fundamentals of Materials Science
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

生物材料实验作为生物学及材料学的交叉学科实验，在结合理论课的基础上，兼顾两门学科实验的特点，在课程实验设计上，材料合成及生物学表征占相同比重，由浅入深的实验安排让学生循序渐进掌握实验技术以及生物材料实验设计的原理和基础知识。

As an interdisciplinary experiment in biology and materials science, based on the combination of theory and experiment, biomaterials experiment takes the same proportion of material synthesis and biological characterization in the experimental design. Experimental arrangements is from shallow to deep for students to gradually grasp the experimental techniques and biological materials experimental design principles and basic knowledge.

16. 预达学习成果 Learning Outcomes

1. 掌握常用材料学及生物学基本实验技术和设备操作方法，并了解设备局限性。
2. 掌握通用评价生物材料的基本技术。
3. 具备生物材料实验设计和数据分析能力。
4. 能够在实验过程中，理解并遵守实验组织、安全、环保等相关规定。
5. 在分组实验中，能够有效地表达和交流，合作完成实验。
6. 能够熟练应用英语完成实验报告和数据分析。
7. 掌握常用材料学及生物学基本实验技术；掌握通用评价生物材料的基本技术；理解设计生物材料的基础知识和原理。

1. To master the basic experimental techniques and equipment operation methods of common materials science and biology, and understand the limitations of the equipments.
2. To master the basic technology of universal evaluation of biological materials.
3. To master the skills of biological material experimental design and data analysis.
4. Be able to understand and comply with relevant regulations of experimental organization, safety and environmental protection during the experiment.
5. Be able to effectively express and communicate in the group experiment, and cooperate to complete the experiment.
6. To use English to complete the experimental report and data 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.)

第一周 抗菌活性炭制备 (4 学时)
 第二周 大肠杆菌培养及无菌操作训练 (4 学时)
 第三周 抗菌实验 (4 学时)
 第四周 抗菌活性炭性能表征 (4 学时)
 第五周 F127-姜黄素合成 (4 学时)
 第六周 F127-姜黄素性能检测 (4 学时)
 第七周 F127-姜黄素红外检测 (4 学时)
 第八周 细胞培养 (4 学时)
 第九周 细胞毒性实验 (8 学时)
 第十周 羟基磷灰石合成 (4 学时)
 第十一周 羟基磷灰石红外检测 (4 学时)
 第十二周 羟基磷灰石性能表征 (4 学时)
 第十三周 高分子-羟基磷灰石纳米复合材料的制备 (4 学时)
 第十四周 细胞增殖实验 (8 学时)

Week 1 Preparation of antibacterial silver-loaded activated carbon (Ag/AC) (4 hours)
 Week 2 *E. coli* culture and aseptic operation training (4 hours)
 Week 3 Antibacterial experiment (4 hours)
 Week 4 Characterization of antibacterial silver-loaded activated carbon (4 hours)
 Week 5 Preparation and of Pluronic F127-Encapsulated Curcumin Micelles (4 hours)
 Week 6 The detection of F127-curcumin (4 hours)
 Week 7 FTIR detection of F127-curcumin (4 hours)
 Week 8 Cell culture (4 hours)
 Week 9 Cell toxicity test (8 hours)
 Week 10 Hydrothermal synthesis and bioactivity of Hydroxyapatite (4 hours)
 Week11 FTIR detection of Hydroxyapatite (4 hours)
 Week 12 Characterization of Hydroxyapatite (4 hours)
 Week13 Hydrothermal synthesis and characterization of Hydroxyapatite (4 hours)
 Week 14 Cell proliferation test (8 hours)

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

无 NA

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		40%		
预习报告 Pre-report		10%		
实验报告 Experiment Report		40%		

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