

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	金属材料实验 Experiments for Metal Materials
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	MSE331
4.	课程学分 Credit Value	1
5.	课程类别 Course Type	专业核心课 Major Core Courses
6.	授课学期 Semester	秋季 Fall
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)	叶飞, 材料科学与工程系, 电子邮箱: yef3@sustech.edu.cn 明静, 材料科学与工程系, 电子邮箱: mingj@sustech.edu.cn 廖成竹, 材料科学与工程系, 电子邮箱: liaocz@sustech.edu.cn 章剑波, 材料科学与工程系, 电子邮箱: zhangjb@sustech.edu.cn Fei Ye, Department of MSE, Email: yef3@sustech.edu.cn Jing Ming, Department of MSE, Email: mingj@sustc.edu.cn Chengzhu Liao, Department of MSE, Email: liaocz@sustc.edu.cn Jianbo Zhang, Department of MSE, Email: zhangjb@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 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	4	0	28		32
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	材料科学基础 Fundamentals of Materials Science MSE207 金属材料 Metal Material MSE329				
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	无 NA				
14. 其它要求修读本课程的学系 Cross-listing Dept.	无 NA				

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

金属材料实验是材料专业的必修实验课程，本实验课程主要是培养学生金属学相关基础实验操作技能，巩固学生金属学相关理论知识的理解，强化学生金属学理论与实践的结合应用，进而全面提升学生的综合素质和应用能力。

“Experiments for Metal Materials” is a required experimental course for materials science. This course is mainly to cultivate students' basic experimental skills in metal materials, to consolidate the students' understanding of the theory of metal materials, as well as to strengthen the combination of theory and practice of metal materials, hence to improve the student' comprehensive quality and application ability.

16. 预达学习成果 Learning Outcomes

1. 掌握常用金属材料基本实验技术和设备操作方法，并了解设备局限性。
2. 掌握通用评价金属材料性质性能的基本技术。
3. 具备设计实验获取金属材料性质性能数据，并进行数据分析能力。
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。

1. To master the basic experimental technology and equipment operation methods for metal materials, and to understand the limitations of equipment.
2. To master the basic techniques of universal evaluation of properties and properties of metal materials.
3. To design experiments to obtain properties and performance data of metal materials and conducting 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.)

1. 教学第一周：金相样品的制备和金相显微镜使用（4 学时）
 2. 教学第三周：铁碳合金-平衡与非平衡组织观察（4 学时）
 3. 教学第五周：金属结晶及铸锭组织观察（4 学时）
 4. 教学第七周：低碳钢的表面渗碳热处理（4 学时）
 5. 教学第九周：低碳钢渗碳层组织观察与扩散分析（4 学时）
 6. 教学第十一周：不锈钢粉末烧结与致密度测量（4 学时）
 7. 教学第十三周：铝合金的固溶处理和时效（4 学时）
 8. 教学第十五周：铝合金的时效组织与硬度分析（4 学时）
-
1. Week 1: Preparation of Metallographic Samples and Use of Metallographic Microscope (4 hours)
 2. Week 3: Observation of Fe-C Alloy-Equilibrium and Non-Equilibrium Microstructures (4 hours)
 3. Week 5: Observation of Metal Crystallization and Ingot Microstructure (4 hours)
 4. Week 7: Surface Carburizing Heat Treatment of Low Carbon Steel (4 hours)
 5. Week 9: Microstructure Observation and Diffusion Analysis of Carburized Layer of Low Carbon Steel (4 hours)
 6. Week 11: Sintering and Density Measurement of Stainless Steel Powder (4 hours)
 7. Week 13: Solution Treatment and Aging of Aluminum Alloys (4 hours)
 8. Week 15: Aging Microstructure and Hardness Analysis of Aluminum Alloy (4 hours)

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

1. 自编实验教材 Experimental Manual

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-reports		10		
实验报告 Experiment Reports		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

--

