

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	固体力学实验 Solid Mechanics Lab				
2.	授课院系 Originating Department	力学与航空航天工程系 Department of Mechanics and Aerospace Engineering				
3.	课程编号 Course Code	MAE401-16				
4.	课程学分 Credit Value	3				
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	中文 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) Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	肖思 教学实验师 Xiao Si Lab teacher 力学与航空航天工程系 Department of Mechanics and Aerospace Engineering xiaos@sustech.edu.cn				
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	肖思 教学实验师 Xiao Si Lab teacher 力学与航空航天工程系 Department of Mechanics and Aerospace Engineering xiaos@sustech.edu.cn				
10.	选课人数限额(可不填) Maximum Enrolment (Optional)					
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	24		54	小组创新实验 18 Group design	96

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	MAE202 材料力学 MAE202 Mechanics of Materials
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

- 让学生熟悉固体力学实验基础知识
- 通过实验操作提高对固体力学知识的理解
- 训练学生动手操作基础材料力学实验和理论力学实验以及对实验数据进行分析的能力
- 提供学生借助固体力学实验平台开展团队创新性实验设计的机会
- To familiarize students with fundamentals of solid mechanics experiments;
- To improve the understanding of solid mechanics knowledge through practical lab experiments;
- To train students to practice hands-on fundamental material mechanics experiments and theoretical mechanics experiments, and process and analyze experimental data obtained;
- To provide students with experience of designing innovative experimental of solid mechanics as a collaborative group.

16. 预达学习成果 Learning Outcomes

经过本课程的训练，学生将掌握以下能力：

了解固体力学实验的重要性；

掌握基本的固体力学实验并能动手操作，对实验过程及结果分析能力，能够独立撰写实验报告；

通过所掌握的固体力学知识及实验开展实验设计；

通过小组创新设计环节掌握对项目的分工合作能力；

On successful completion of the course, students will be able to:

Appreciate the importance of lab experiments to solid mechanics;

Demonstrate the understanding and ability to operate fundamental solid experiments, process and analyze experimental data, and write up lab reports independently;

Design practical experimental rigs by using knowledge of solid mechanics theories and labs;

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.)

第一课（6学时）课程概述，介绍固体力学实验项目（概述，研究领域，发展历史等），参观实验室

Section 1 (6 credit hours) Course overview; Introduction to solid mechanics experiments (overview, research areas, history, and objectives); Visit the laboratories

第二课（6学时）电测法基础，练习粘贴应变片及连接电桥，应变片灵敏度标定

Section 2 (6 credit hours) Fundamentals of electrometric method; Practice attaching strain gauge and connecting circuits; Calibrate sensitivity of strain gauge

第三课（6学时）拉伸与压缩实验，扭转实验

Section 3 (6 credit hours) Stretching and compression experiments; Torsion experiment

第四课（6学时）纯弯曲梁实验，叠合梁实验

Section 4 (6 credit hours) Pure bending beam experiment; Composite beam experiment

第五课（6学时）悬臂梁实验，等强度梁实验

Section 5 (6 credit hours) Cantilever beam experiment; Equal strength beam experiments

第六课（6学时）弯扭组合实验，偏心拉伸实验

Section 6 (6 credit hours) Bending and twisting combination experiment; Eccentric Tensile Test

第七课（6学时）工程材料弹性常数测定实验，压杆稳定实验

Section 7 (6 credit hours) Determination the elastic constants of engineering materials; Test the stability of the compressed rod

第八课（6学时）桁架结构内力测量实验

Section 8 (6 credit hours) Measurement the internal force of truss structure

第九课（6学时）动、静摩擦系数测定，弹簧振动系统实验

Section 9 (6 credit hours) Measurement of dynamic and static friction coefficient; Experiments on spring vibration system

第十课 (6 学时) 转动惯量测量实验, 四种载荷观测实验, 重心测定实验

Section 10 (6 credit hours) Measurement of rotational inertia; Observations and understanding of four different load ; Measurement of gravity centre

第十一课 (6 学时) 振动系统实验 I

Section 11 (6 credit hours) Vibration System Series Experiments I

第十二课 (4 学时) 振动系统实验 II

Section 12 (4 credit hours) Vibration System Series Experiments II

第十三课 (6 学时) 光测力学实验, 冲击动力学实验

Section 13 (6 credit hours) Photometric mechanics experiments; Impact dynamics experiments

第十四、十五课 (12 学时) 小组设计项目

Section 14-15 (12 credit hours) Group design projects

第十六课 (6 学时) 展示汇报

Sections 16 (6 credit hours) Oral presentation

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

古滨, 万鸿, 《材料力学实验指导与实验基本训练》, 北京理工大学出版社, 2011 年

付朝华, 胡德贵, 蒋小林, 《材料力学实验》, 清华大学出版社, 2013 年

庄表中, 王惠明, 《应用理论力学实验》, 高等教育出版社, 2009 年

刘鸿文, 《材料力学 I》, 高等教育出版社, 2003 年

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		15		

Class Performance			
小测验 Quiz			
课程项目 Projects	25		Group design
平时作业 Assignments	60	抄袭记为 0 分 Cheating:0	Lab reports
期中考试 Mid-Term Test			
期末考试 Final Exam			
期末报告 Final Presentation			
其它（可根据需要 改写以上评估方 式） Others (The above may be modified as necessary)			

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

力学与航空航天工程系教学指导委员会
 The commission of teaching instruction in department of mechanics and aerospace engineering

