

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	流体力学实验 Fluid 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	MAE302
4.	课程学分 Credit Value	2
5.	课程类别 Course Type	专业核心课 Major Core Courses
6.	授课学期 Semester	春季 Spring
7.	授课语言 Teaching Language	中英双语 English & 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)	刘宇 副教授 力学与航空航天工程系 liuy@sustech.edu.cn LIU Yu Associate Professor Department of Mechanics and Aerospace Engineering liuy@sustech.edu.cn
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	刘晓宇、赵晓争 实验员 力学与航空航天工程系 liuxy7@sustech.edu.cn, zhaoxz@sustech.edu.cn LIU Xiaoyu, ZHAO Xiaozheng Tutor Department of Mechanics and Aerospace Engineering liuxy7@sustech.edu.cn, zhaoxz@sustech.edu.cn
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	30

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	12		52		64
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	MAE303 流体力学 或 MAE207 工程流体力学 MAE303 Fluid Mechanics / MAE207 Engineering Fluid Mechanics				
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

- 帮助学生熟悉流体力学实验的基本知识与操作;
- 通过实际的实验操作增强学生对流体力学知识的理解;
- 训练学生掌握基本水力学实验操作, 以及如何处理与分析实验数据;
- 学习如何在合作团队里面设计创新型流体力学实验装置。
- To familiarize students with fundamentals of fluid mechanics experiments;
- To improve the understanding of fluid mechanics knowledge through practical lab experiments;
- To train students to practice hands-on fundamental hydraulic experiments, and process and analyze experimental data obtained;
- To provide students with experience of designing innovative experimental rigs of fluid mechanics as a collaborative group.

16. 预达学习成果 Learning Outcomes

顺利完成本课程学习后, 学生们将会:

- 认识到实验研究对流体力学的重要性;
- 理解并有能力独立操作基本水力学实验, 处理和分析实验数据、以及撰写实验报告;
- 运用流体力学理论与实验知识设计实际的实验装置;
- 通过团队协作认识到项目管理、团队意识与沟通等技能的重要性。

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

- Appreciate the importance of lab experiments to fluid mechanics;
- Demonstrate the understanding and ability to operate fundamental hydraulic experiments, process and analyze experimental data, and write up lab reports independently;
- Design practical experimental rigs by using knowledge of fluid mechanics theories and labs;
- Appreciate the importance of project management, teamwork, communication, etc. through working as a collaborative group.

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 1 课（3 课时）课程概述、实验操作、团队设计项目
 流体力学实验简介（概述、研究领域、发展历史、研究目标）

第 2 课（3 课时）流体力学实验简介（概述、研究领域、发展历史、研究目标）
 相似性理论、流体力学实验设备与技术

第 3 课（3 课时）流体力学实验：操作实验原理

第 4 课（3 课时）流体力学实验：操作实验原理
 流体力学实验：演示实验

第 5 – 14 课（10 x 1.5 课时）流体力学实验：操作实验

第 6 – 15 课（10 x 3.5 课时）团队设计项目：每周组会（0.5 课时），项目工作（3 课时）

第 16 课（2 课时）团队设计项目：项目陈述

Section 1 (3 credit hours)
 Course overview, lab experiments, group design project
 Introduction to fluid mechanics experiments (overview, research areas, history, and objectives)

Section 2 (3 credit hours)
 Introduction to fluid mechanics experiments (overview, research areas, history, and objectives)
 Similarity theory, fluid mechanics experiment facilities & techniques

Section 3 (3 credit hours)
 Lab experiments: Theory of hands-on practice

Section 4 (3 credit hours)
 Lab experiments: Theory of hands-on practice
 Lab experiments: Demonstration

Sections 5 – 14 (10 x 1.5 credit hours)
 Lab experiments: Practice

Sections 6 – 15 (10 x 3.5 credit hours)
 Group design project: Weekly group meetings (0.5 hour), project work (3 hours)

Section 16 (2 credit hours)
 Group design project: Oral presentation

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

毛根海，章军军，陈少庆，胡卫红，《应用流体力学实验》，高等教育出版社，2008
 毛根海团队，《工程流体力学实验指导书与报告》，杭州源流科技有限公司，2015

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 Class Performance		5		项目表现 Project performance
小测验 Quiz				
课程项目 Projects		35		项目开题 Project proposal 10% (小组分数 Group mark) 项目报告 Project report 25%
平时作业 Assignments		40	抄袭实验报告记 0分 Cheating: 0	实验报告 Lab reports 4% x 10
期中考试 Mid-Term Test				
期末考试 Final Exam	1 小时	15		口试 Oral exam
期末报告 Final Presentation	2 小时	5		(小组分数 Group mark)
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