

课程大纲 COURSE SYLLABUS

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| 1. | 课程代码/名称 Course Code /Title | MAE5013 高等实验流体力学 Advanced Experimental Fluid Mechanics |
| 2. | 课程性质 Compulsory/Elective | 专业核心课 Graduate core course |
| 3. | 课程学分/学时 Course Credits/Hours | 3/48 |
| 4. | 授课语言 Teaching Language | 中文 |
| 5. | 授课教师 Instructor(s) | 待定 |
| 6. | 是否面向本科生开放 Open to undergraduates or not | 否 NO |
| 7. | 先修要求 Pre-requisites | (如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) |
| 8. | 教学目标 Course Objectives | |
| | <p>本课程从流体力学的基本概念和基本原理出发, 结合实验力学理论, 介绍了流体力学实验技术、设备和流体力学实验原理以及用实验的方法研究流体力学的前沿课题, 使学生掌握流体力学的现代实验方法和技能, 培养学生用实验研究的方法分析、解决流体力学问题的能力。</p> <p>Based on the basic concepts and theories of fluid mechanics as well as the theories of experimental mechanics, the present course introduces the advanced measurement technologies, equipment, the theories of experimental fluid mechanics and how to solve the cutting-edge fluid problems by experiment. The present course would help postgraduates to grasp the modern experimental technologies and skills of fluid mechanics, provide postgraduates the capability to analyse and solve the fluid mechanics problems by experiment.</p> | |
| 9. | 教学方法 Teaching Methods | |
| | 课堂授课与实验课 Lectures and Experiments | |
| 10. | 教学内容 Course Contents | |
| | 理论课时 | |
| | Section 1 | 量纲分析 (3 学时) Theories: Scaling analysis (3) |
| | Section 2 | 误差分析 (3 学时) Certainty analysis (3) |
| | Section 3 | 流体力学实验设备 (3 学时) equipment for experimental fluid mechanics (3) |
| | Section 4 | PIV 测量技术 (6 学时) PIV technique (6) |
| | Section 5 | 热线测速技术 (6 学时) LDV technique (6) |
| | Section 6 | 光学测量技术 (6 学时) Image-based technique (6) |

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| 实验课时 | |
| Section 1 | PIV 测量技术 (6 学时) PIV experiment (6) |
| Section 2 | 热线测速技术 (6 学时) LDV experiment (6) |
| Section 3 | 光学测量技术 (3 学时) Image-based experiment (3) |
| Section 4 | PIV 测量技术 (6 学时) PIV experiment (6) |
| Section 5 | 现代湍流实验 (6 学时) modern turbulence experiment (6) |
| 11. | 课程考核 Course Assessment |
| | 考查: 课堂表现 40% (出勤 20%+实验操作 20%) + 实验报告 60% |
| 12. | 教材及其它参考资料 Textbook and Supplementary Readings |
| | 洪水棕、方之楚、单雪雄: 现代测试技术 (上海交通大学出版社) 盛森芝等: 热线热膜流速计 (中国科学技术出版社) 戴昌辉: 流体流动测量 (航空工业出版社) |