**《航空航天实验I》课程教学大纲**

**Course Syllabus**

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| A. 课程基本信息/Course Information |
| 课程代码Course Code | AV316 | 学时（Credit Hours） | 32 | 学分（Credits） | 2 |
| 课程名称Course Title | 航空航天实验IAerospace Experiment I |
| 课程性质Course Type | 教学实验Teaching Experiment |
| 授课对象Intended Audience | 本科生Undergraduate |
| 授课语言Language ofInstruction | 中文Chinese |
| 开课院系Offered by | 航空航天学院School of Aeronautics and Astronautics |
| 先修课程Prerequisite(s) | AV103航空航天概论（B类）(Introduction to Aeronautics and Astronautics)AV202空气动力学（1）(Aerodynamics (1))AV205工程热力学（D类）(Engineering Thermodynamics)AV309空气动力学（2）(Aerodynamics (2)) |
| 授课教师Instructor(s) | 吕新颖 吴俊琦Xinying Lv Junqi Wu | 课程网址Course Webpage |  |
| 课程简介CourseDescription | 本课程性质是航空航天学院本科学生的一门必修课，学生将亲自动手进行实验操作与分析计算。课程主要教学内容包括：空气动力学实验（如层流、风洞、雷诺、伯努利、可压流实验）、工程热力学实验等；学生从预习自学开始，将以学科理论出发，确定实验对象，搭建实验装置，选取实验测量仪器，完成实验操作、调试、测量、记录与分析计算，并撰写实验报告。此外，还会开展延伸课程，让学生根据自己的兴趣和各学科疑难问题，进行新实验的设计、搭建与操作。课程教学目的通过该课程的学习和动手操作，使得学生把理论与实践紧密结合，学以致用，直观地认识复杂抽象的理论知识与公式。熟悉航空航天各专业实验技术及测试分析手段，为今后从事航空航天系统设计、制造以及研究工作打下基础。This course is a compulsory course for the undergraduate students of aerospace, and the students will do the experiment and analysis. The main teaching contents of curriculum includes: aerodynamic experiment . Students from prep self-study began, on the theory of determined experimental object, build experimental device, experimental instrument selection, to complete the experiment, debugging, measurement, recording and analysis and calculation, and write test report. In addition, it will carry out the extension course, let the students according to their own interests and the subject of difficult problems, the design, construction and operation of new experiments. Teaching aim through the course of learning and hands-on, the students combine theory and practice to apply what they have learned, intuitively understanding abstract and complex theories and formulas. Familiar with the aviation and aerospace professional experimental technology and test analysis means, for the future to engage in aerospace system design, manufacturing and research work. |
| B. 课程教学大纲/Detailed Syllabus |
| 1. 学习目标/Learning Outcomes(1) 价值贡献树立“奋发图强、空天报国”信念(**A3.1**)。数学或逻辑学的基础知识——在基础教育水平之上，进一步培养学生的定量分析和逻辑思维能力。(**A4**) (2) 知识贡献发现、分析和解决问题的能力(**B2**)。掌握科学实验（研究）的基本的方法论(**B6.1.3**)。掌握完整的航空航天工程的基础知识体系，理解科学、工程、社会的关系，理解航空航天系统的复杂性，正确认识航空航天作为现代社会最尖端的技术之一的重要性和潜在的发展能力(**B6.2**)。(3) 能力贡献刻苦务实、精勤进取——脚踏实地，不慕虚名；勤奋努力，追求卓越(**C2**)。具备关于社会因素和社会影响力在本专业中的重要性的认识(**C7**)。(4) 素质贡献刻苦务实、意志坚强(**D1**)。诚实守信，忠于职守(**D3**)。通过学习职业道德和学术诚信标准并实践，初步养成良好的职业诚信素质(**D6**)。初步具备科学素养(**D9**)。 |
| 2. 教学内容、进度安排及要求/Schedule & Requirements

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| 教学内容Topic | 学时CreditHour | 教学方式Format | 作业及要求Assignment | 基本要求Requirement | 考查方式Evaluation |
| Safety knowledge education | 2 | Teaching | Answer the questions about safety knowledge | Understand the importance of safety  | Submit the test paper |
| Temperature Measurement and Calibration | 2 |  Experiment | After each experiment,student should complete the experiment report independently | Prepare lessons before class | Experiment Report， Attendance and Performance |
| Pressure Measurement and Calibration | 2 |  Experiment |
| Saturation Pressure | 2 |  Experiment |
| Laminar Flow Table | 2 |  Experiment |
| Wind Tunnel | 2 |  Experiment |
| Osborne Reynolds' Demonstration | 2 |  Experiment |
| Bernoulli's Theorem Demonstration | 2 |  Experiment |
| Compressible Flow Bench | 2 |  Experiment |
| Axial Fan | 2 |  Experiment |
| Linear Heat Conduction | 2 |  Experiment |
| Unsteady Heat Transfer | 2 |  Experiment |
| Heat Exchanger | 2 |  Experiment |
| Tensile properties of materials  | 2 | Experiment |
| Compress properties of materials | 2 | Experiment |
| Bending and shear strength of materials | 2 | Experiment |

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| 3. 考核方式及规定/Grade Composition and Grading PolicyExperiment Report 70%Attendance and Performance 30% Total 100% |
| 4. 教材或参考资料Textbook & ReferencesArmfiled Instruction Manual |
| 5. 其它/Additional Information: |
| 6. 备注/Note(s): |