**上海交通大学硕士研究生课程教学大纲**

|  |
| --- |
| 课程基本信息（Course Information） |
| 课程代码（Course Code） | ME26001 | \*学时（Credit Hours） | 48 | \*学分（Credits） | 6 |
| \*课程名称（Course Name） | (中文) 测试原理、传感器与系统 |
| （英文）Basic Principle of Sensors and Systems for Mechanical Measurement |
| 课程性质(Course Type) | 本一级学科内基础理论、基本知识和基本技能的课程 |
| 授课语言(Language of Instruction) | 英语 |
| \*开课院系（School） | China-UK Low Carbon College |
| 先修课程（Prerequisite） | 工程信号处理及应用,检测技术，动态信号及模式识别，传感器系统Signal processing for mechanical engineering, Detecting technique, Dynamic signal and mode identification, Sensors |
| 授课教师（Teacher） | 董雪 | 课程网址(Course Webpage) |  |
| \*课程简介（Description） | Basic Principle of Sensors and Systems for Mechanical Measurement is a course for graduate students and it involves basic measuring concepts and a wide variety of practical applications that are motivated by or relate to various theoretical concepts. This is a coursework that is useful for graduate students in mechanical engineering and practicing engineers. It also covers topics related to sensor fusion, computer vision and machine learning for data processing etc. |
| 课程教学大纲（course syllabus） |
| \*学习目标(Learning Outcomes) | Understand the fundamental concepts and principles of mechanical measurement; comprehend advanced measurement and instrumentation; perform updated literature review on sensors, measuring technique and data processing algorithm; compare and analyze the uncertainty, reliability and redundancy of measuring systems; design sensor fusion, data acquisition and processing systems for practical application |
| \*教学内容、进度安排及要求(Class Schedule& Requirements) |

|  |  |  |
| --- | --- | --- |
| 1. Fundamentals of Measurement Systems  | Homework | Week 1 |
| 2. Instrument Types and Performance Characteristics | homework | Week 2 |
| 3. Measurement Uncertainty | Homework | Week 3 |
| 4. Sensor Technologies  | Homework | Week 4 |
| 5. Calibration of Measuring Sensors and Instruments  | Homework | Week 5 |
| 6. Data Acquisition and Signal Processing | Homework | Week 6 |
| 7. Temperature, Pressure and Flow Measurement | Homework | Week 7 |
| 8. Measurement and Instrumentation for Practical Applications | Homework | Week 8-9 |
| 9. Computer Vision | Homework | Week 10-12 |
| 10. Projects on measurement system design, oral presentation and defense | Oral presentation and defense  | Week 3-15 |
| 11. Final exam | Week 16 |

 |
| \*考核方式(Grading) | Homework (30%)Projects on measurement system design, oral presentation and defense (40%)Final exam (30%) |
| \*教材或参考资料(Textbooks & Other Materials) | **Measurement and Instrumentation-Theory and Application** by Alan S. Morris & Reza Langari[[Sensors for Mechatronics](https://www.scopus.com/record/display.uri?eid=2-s2.0-85013892209&origin=resultslist&zone=contextBox) by [Regtien, P.P.L.](https://www.scopus.com/authid/detail.uri?authorId=7003271639&origin=resultslist&zone=contextBox)](https://www.amazon.com/Internal-Combustion-Engine-Fundamentals-Heywood/dp/007028637X)  |
| 其它（More） | Literature review will be required before each class, and the reading materials will be released beforehand. |
| 备注（Notes） | None |

备注说明：

1.课程大纲一般为教师网上填写，填写要求会自动提示；对于新开课程，需要填着纸质大纲，并经院系教学委员会或专业委员会通过。

2．带\*内容为必填项。

3．课程简介字数为300-500字；课程大纲以表述清楚教学安排为宜，字数不限。