

课程大纲

COURSE SYLLABUS

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| 1. | 课程代码/名称 Course Code/Title | MAE5008 连续介质力学 A (Continuum Mechanics A) | | | | | | | | | | |
| 2. | 课程性质 Compulsory/Elective | 专业必修课 | | | | | | | | | | |
| 3. | 课程学分/学时 Course Credit/Hours | 3/48 | | | | | | | | | | |
| 4. | 授课语言 Teaching Language | 英语 English | | | | | | | | | | |
| 5. | 授课教师 Instructor(s) | 吴雷, 力学与航空航天系 邮箱: wul@sustech.edu.cn 电话: 0755-88018665 Lei Wu, Department of Mechanics and Aerospace Engineering Email: wul@sustech.edu.cn Tel: 0755-88018665 | | | | | | | | | | |
| 6. | 先修要求 Pre-requisites | | | | | | | | | | | |
| 7. | 教学目标 Course Objectives | <p>本课程为力学与航空航天工程系研究生专业核心课, 主要讲述连续介质力学的基本理论, 培养学生从全局观点分析连续介质(固体、流体)力学问题的素质和在科研中运用所学知识的能力。</p> <ul style="list-style-type: none"> ● 学习使用张量数学工具来严格地简洁地建立和推导出力学问题的数学模型。 ● 运用守恒定理来求解固体和流体力学中的一些代表性问题。 <p>This is a core course for master students in the Department of Mechanics and Aerospace Engineering, which covers the fundamental theory of continuum mechanics. It aims to prepare the students with basic abilities to analyse the continuum mechanics problems from an overall point of view and use what they have learned in future research.</p> <ul style="list-style-type: none"> ● Learn to formulate mechanics problems rigorously and concisely using tensor notations. ● Apply balance laws to solve representative problems in solids and fluids mechanics. | | | | | | | | | | |
| 8. | 教学方法 Teaching Methods | 课题讲授 | | | | | | | | | | |
| 9. | 教学内容 Course Contents | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Section 1</td> <td>Introduction (1 hour)</td> </tr> <tr> <td>Section 2</td> <td>Vectors and Tensors (5 hours)</td> </tr> <tr> <td>Section 3</td> <td>Stress Analysis (6 hours)</td> </tr> <tr> <td>Section 4</td> <td>Analysis of Deformation (6 hours)</td> </tr> <tr> <td>Section 5</td> <td>Derivation of Field Equations (9 hours)</td> </tr> </table> | Section 1 | Introduction (1 hour) | Section 2 | Vectors and Tensors (5 hours) | Section 3 | Stress Analysis (6 hours) | Section 4 | Analysis of Deformation (6 hours) | Section 5 | Derivation of Field Equations (9 hours) |
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| | Section 6 | Constitutive Relations (3 hours) |
| | Section 7 | Fluid Mechanics (10 hours) |
| | Section 8 | Some Simple Problems in Elasticity (8 hours) |
| 10. | 课程考核 Course Assessment | |
| | 请再此注明：①考查/考试；②分数构成。 考试。 出勤 Attendance 10%+期中考试 Mid-Term Test 20% +期末考试 Final Exam 70% | |
| 11. | 教材及其它参考资料 Textbook and Supplementary Readings | |
| | A First Course in Continuum Mechanics <i>for Physical and Biological Engineers and Scientists</i> , 3 rd Edition, by Y. C. Feng. (中文翻译版：连续介质导论，作者冯元桢) | |
| | Introduction to Continuum Mechanics, 4 th Edition, by W. Michael Lai, David Rubin, and Erhard Krempf. | |