

课程大纲

COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	MAE8002 高等连续介质力学 A Advanced Continuum Mechanics A
2.	课程性质 Compulsory/Elective	专业必修课 Major Core Courses
3.	课程学分/学时 Course Credit/Hours	3/48
4.	授课语言 Teaching Language	英文 English
5.	授课教师 Instructor(s)	袁鸿雁, 力学与航空航天系 邮箱: yuanhy3@sustech.edu.cn 电话: 0755-88018285 Hongyan Yuan, Department of Mechanics and Aerospace Engineering Email: yuanhy3@sustech.edu.cn Tel: 0755-88018285
6.	先修要求 Pre-requisites	
7.	教学目标 Course Objectives	
		<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力学问题的数学模型。(Learn to formulate mechanics problems rigorously and concisely using tensor notations.) ● 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。(Apply balance laws to solve representative problems in solids and fluids mechanics.) ● 学习固体材料和结构, 流体介质等的力学行为的一些基本原理。(Understanding fundamental principles governing the behaviour of continuum solids and fluids.)
8.	教学方法 Teaching Methods	
9.	教学内容 Course Contents	
	Section 1	Vectors (2 hours)
	Section 2	Survey of elementary principles in classical mechanics (2 hours)
	Section 3	Tensors (6 hours)
	Section 4	Kinematics of a Continuum (6 hours)
	Section 5	Stress and Integral Formulations of General Principles (6 hours)
	Section 6	The Elastic Solid (10 hours)
	Section 7	Newtonian Viscous Fluid (6 hours)
	Section 8	The Reynolds Transport Theorem and Applications (6 hours)
	Section 9	Non-Newtonian Fluids (4 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 **Exam.**

平时作业 **Assignments 30%** + 期中考试 **Mid-Term Test 30%** + 期末考试 **Final Exam 40%**

11. 教材及其它参考资料

Textbook and Supplementary Readings

1. Introduction to Continuum Mechanics, Lai, W.M., Rubin, D., and Krepl, E., 4th Edition, Elsevier.
2. e-book: Mechanics Lecture Notes Part III: Foundations of Continuum Mechanics, by Piaras Kelly.

Other references:

1. Classic Mechanics, Goldstein, et al., 3rd Edition.
2. Nonlinear Finite Element Method, Peter Wriggers, Springer