

# 课程大纲

## COURSE SYLLABUS

1.	<b>课程代码/名称</b> Course Code/Title	MAE8001 高等连续介质力学 Advanced Continuum Mechanics
2.	<b>课程性质</b> Compulsory/Elective	专业核心课 Graduate core course
3.	<b>课程学分/学时</b> Course Credit/Hours	3/48
4.	<b>授课语言</b> Teaching Language	英文 English
5.	<b>授课教师</b> 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.	<b>是否面向本科生开放</b> Open to undergraduates or not	否 NO
7.	<b>先修要求</b> 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.	<b>教学目标</b> Course Objectives	
	<ul style="list-style-type: none"> <li>● 学习使用张量数学工具来严格地简洁地建立和推导演力学问题的数学模型。</li> <li>● 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。</li> <li>● 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。</li> </ul> <ul style="list-style-type: none"> <li>● Learn to formulate mechanics problems rigorously and concisely using tensor notations.</li> <li>● Apply balance laws to solve representative problems in solids and fluids mechanics. Understanding fundamental principles governing the behaviour of continuum solids and fluids.</li> </ul>	
9.	<b>教学方法</b> Teaching Methods	
	讲授 Lectures	
10.	<b>教学内容</b> Course Contents	
	<b>Section 1</b>	Tensor (6 hours)
	<b>Section 2</b>	Kinematics of a Continuum (6 hours)
	<b>Section 3</b>	Stress and Integral Formulations of General Principles (6 hours)
	<b>Section 4</b>	The Elastic Solid (10 hours)
	<b>Section 5</b>	Newtonian Viscous Fluid (8 hours)

	<b>Section 6</b>	The Reynolds Transport Theorem and Applications (6 hours)
	<b>Section 7</b>	Non-Newtonian Fluids (6 hours)
<b>11.</b>	<b>课程考核 Course Assessment</b>	
	<p>1. final exam</p> <p>2. 分数构成 grading policy</p> <ul style="list-style-type: none"> <li>➤ Attendance (10%)</li> <li>➤ Homework (20%)</li> <li>➤ Mid-Term Test(30%)</li> <li>➤ Final exam (40%)</li> </ul>	
<b>12.</b>	<b>教材及其它参考资料 Textbook and Supplementary Readings</b>	
	<p>Textbook:</p> <ul style="list-style-type: none"> <li>➤ Lai, W.M., Rubin, D., and Krempl, E., Introduction to Continuum Mechanics, Elsevier, 2010</li> </ul> <p>Other references:</p> <ul style="list-style-type: none"> <li>➤ Applied Mechanics of Solids, Allan Bower, <a href="http://solidmechanics.org/index.html">http://solidmechanics.org/index.html</a></li> </ul>	