

* Course Name	Chinese																																			
	English Nonlinear Constitutive Models with Applications in Forming																																			
* Credits	2	* Teaching Hours	32 1 =16																																	
* Semester	Spring	* Cross-semester?	No	Spanning over Semesters																																
* Course Type	Program Elective Course	* Course Type	For full-time students																																	
* Course Category	Specialized Course	Targeting Students	Doctoral Level																																	
* Instruction Language	English	Teaching Method	In class teaching																																	
* Grade	Letter grading	Exam Method	Essay																																	
* School	050 School of Material Science and Engineering																																			
Subject	Material Science and Engineering																																			
Person in charge	Name	ID	School	E-mail																																
				xqpeng@sjtu.edu.cn																																
* ( ) Course Description	200  ABAQUS																																			
* English Course Description	This is a Doctoral Elective Course. The course aims at illuminating mechanics principles of material models. The objective of the course is for students to master the basic principles of continuum mechanics, to understand some basic nonlinear material models including hyperelastic, elasto-plastic and viscoelastic etc, which will lay a theoretical foundation for their further studies on other courses related with forming of materials, metal or composites. Practical applications with commercial FEM software package will also be provided. Prerequisites for the course are mechanics of materials, matrix theory, finite element method etc.																																			
* ( ) Syllabus	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td></td> <td>1</td> <td></td> </tr> <tr> <td>2</td> <td></td> <td>3</td> <td></td> </tr> <tr> <td>3</td> <td></td> <td>4</td> <td></td> </tr> <tr> <td>4</td> <td></td> <td>4</td> <td></td> </tr> <tr> <td>5</td> <td></td> <td>2</td> <td></td> </tr> <tr> <td>6</td> <td></td> <td>4</td> <td></td> </tr> <tr> <td>7</td> <td></td> <td>10</td> <td></td> </tr> </table>								1		1		2		3		3		4		4		4		5		2		6		4		7		10	
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* English Syllabus		Chapter	Main Contents	Hours	Teaching method
		1	Course Introduction	1	In class teaching
		2	Mathematical Background	3	In class teaching
		3	Strains	4	In class teaching
		4	Stresses	4	In class teaching
		5	Conservation Laws	2	In class teaching
		6	Lagrangian Finite Element Methods	4	In class teaching
		7	Constitutive Models	10	In class teaching
		1	Modelling and Forming of Fabric Reinforced Composites	2	In class teaching
		2	Human Spine Biomechanics	2	In class teaching
* Requirements		50			
	10%	25%	65%		
* English Requirements	The course assessment results consist of three parts: usual attendance, homework score and project score. Among them, attendance accounts for 10%, homework accounts for 25%, and projects account for 65%. Discussion among classmates is encouraged, but plagiarism is strictly prohibited.				
* Resources	<ol style="list-style-type: none"> <li>1. A first course in Continuum Mechanics, Y.C. Fung, 3rd Edition, Prentice-Hall, 1994.</li> <li>2. Nonlinear Finite Elements for Continua and Structures, T. Belytschko, W.K. Liu and B. Moran, John Wiley &amp; Sons, 2001</li> <li>3. Mechanics of Sheet Metal Forming, J. Hu, Z. Marciniak and J. Duncan, Butterworth Heinemann, 2002</li> </ol>				
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