

Advanced Joining Technologies

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* Course Name	Chinese			
	English	Advanced Joining Technologies		
* 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 b at g !			
* Grade	Letter grading	Exam Method	Essay	
* School				
Subject				
Person in charge	Name	ID	School	E-mail
				xhtang@sjtu.edu.cn
Advanced Joining Technologies				
* () Course Description	200 “ ”			
* English Course Description	<p>With the progress of science and the development of technology, the material joining technology is updated quickly. Many innovative technologies are applied in the material joining to produce a lot of new joining methods and technologies. The “Advanced Joining Technologies” is a course to introduce the present advanced joining technologies over the world. It is mainly involved in the new high efficient joining methods and technologies applied in the manufacturing fields of automobile, shipbuilding, aerospace, nuclear power, etc. These technologies may have been derived from the traditional joining technologies under the impetus of the innovative technologies in material science and engineering, digitalization, sensor, information and intelligent control. They include but are not limited to the high efficient multi-wire arc welding,</p>			

	<p>the narrow gap welding, the ultra-narrow gap laser welding, the friction stir welding, the fusion brazing, the arc stud welding, the transient liquid phase diffusion welding, the electromagnetic pulse welding, etc. It focuses on the introduction of the principles, characteristics, research hotspots, application status and development trends of these technologies, to give students a new vision of present innovative development of the material joining technology in advanced manufacturing. The course is a multidisciplinary comprehensive course, mainly introducing the advanced joining technologies. The prerequisite courses for learning this course include the fundamentals of material science, the principle of material processing, and the modular curriculum of material joining science. It is suitable for the postgraduate students and doctoral candidate in material science and engineering. It may help them to enrich the expertise in material joining technology and to expand the vision in this field, as well as to guide them to grasp the scientific research direction correctly.</p>																														
<p>* () Syllabus</p>	<table> <tr><td>1</td><td>1</td><td></td></tr> <tr><td>2</td><td>3</td><td></td></tr> <tr><td>3</td><td>6</td><td>+</td></tr> <tr><td>4</td><td>6</td><td>+</td></tr> <tr><td>5</td><td>4</td><td></td></tr> <tr><td>6</td><td>4</td><td>+</td></tr> <tr><td>7</td><td>2</td><td></td></tr> <tr><td>8</td><td>2</td><td></td></tr> <tr><td>9</td><td>2</td><td></td></tr> <tr><td>10</td><td>2</td><td></td></tr> </table>	1	1		2	3		3	6	+	4	6	+	5	4		6	4	+	7	2		8	2		9	2		10	2	
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<p>* Requirements</p>	<p>50</p>																														
<p>* English Requirements</p>	<p>By learning of this course, the students may understand the latest development of material joining technology in advanced manufacturing, grasp the principles, characteristics and research hotspots, application status and development trend of current mainstream advanced joining technologies. Through exploration and study of these new advanced joining technologies, the students would understand the promotion and influence of development of related other interdisciplinary technology on material joining technology, enrich the knowledge and expand the vision in this field. It is helpful for the students to master the scientific research methods, and to enlighten them to grasp the correct research direction in the material joining science field.</p>																														

