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	Dcuke"Kphqt o cvkqp"						
*	Chinese	;					
Course Name	English		Advanced Joi ni no	Advanced Joi ni ng Technol ogi es			
* Credits	2		* Teaching Hours		32 1 =16		
* Semester	Sprin	g	* Cross-semester?	No	Spanning over Semesters		
* Course Type	Pro Course	gram Electi	ve * Course Type		For full-time students		
* Course Category	Specialized b		at	g	!		
* Grade	Letter grading		Exam Method	E	Essay		
* School							
Subject							
Person in charge	Name	ID	School		E-mail		
					xhtang@sjtu.edu.cn		
			Gzvgpfgf"Kphqt o cv	kqp"			
*  ( )  Course Description			"		200		
* English Course Description	technology is up to produce a lot of is a course to in involved in the r fields of automo- been derived fr technologies in	odated quickly of new joining troduce the new high effit bile, shipbut om the trad material s	ly. Many innovative techning methods and technolog present advanced joining cient joining methods and ilding, aerospace, nuclear litional joining technolog cience and engineering.	nologies a ries. The " technologies technologies power, e gies under digitaliz	rechnology, the material joining re applied in the material joining Advanced Joining Technologies" gies over the world. It is mainly gies applied in the manufacturing tc. These technologies may have the impetus of the innovative ration, sensor, information and efficient multi-wire are welding		

	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.				
* ( ) Syllabus	1 1 2 3 3 3 6 4 6 5 4 6 7 2 8 9 2 10 2		+ +		
* English Syllabus	Chapter 1 Introduction Chapter 2 High efficient multi-wire arc welding Chapter 3 Narrow gap welding Chapter 4 High-power gap laser welding Chapter 5 Friction stir welding Chapter 6 Fusion brazing Chapter 7 Stud welding Chapter 8 Diffusion joining Chapter 9 Electromagnetic pulse welding Chapter 10 Advanced mechanical joining	1 hr. 3 hrs. 6 hrs. 6 hrs. 4 hrs. 4 hrs. 2 hrs. 2 hrs. 2 hrs. 2 hrs.	lecture lecture + experiment lecture + experiment lecture + experiment lecture lecture + experiment lecture lecture lecture		
* Requirements	50				
* English Requirements	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.				

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* Resources	1) , , , , , , , , , , , , , , , , , , ,
* English Resources	<ol> <li>Chen Yuchuang, Li Shaonong, et al., Modern high-efficient welding methods and their applications, Mechanical Industry Press, 2015.11 (In Chinese)</li> <li>Zhang Hongtao, Chen Yuhua, Special welding technology HIT press 2013.8 (In Chinese)</li> <li>Lin Shanbao, Fan Chenlei, et al., High-efficient welding methods, Mechanical Industry Press, 2012.3 (In Chinese)</li> <li>Shanghai Welding Society, Welding advanced technology, Shanghai Sci.&amp; Tech. Literature Press, 2010.8 (In Chinese)</li> <li>John Norrish, translated by Shi Qinyu et al., Advanced welding methods and technologies, Mechanical Industry Press, 2010.7 (In Chinese)</li> <li>Zhang Keke, Xu Yimin Special advanced joining methods, HIT Press, 2008.6 (In Chinese)</li> <li>Zhang Yi, et al., Stud welding technology and its applications, Mechanical Industry Press, 2009.10 (In Chinese)</li> <li>Seiji Katayama, Handbook of laser welding technologies, Woodhead Publishing Ltd., 2013</li> <li>Flemming Ove Olsen, Hybrid laser-arc welding, Woodhead Publishing Ltd., 2009</li> <li>Nasir Ahmed, New development in advanced welding, Woodhead Publishing Ltd., 2005</li> </ol>
Note	MT26020 MSE8322

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