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*	Chinese			
Course Name	English Preparation S	Science of Composite	Materials	
* Credits	2	* Teaching Hours		32 1 =16
* Semester	Fall	* 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	Chinese	Teaching Method	In class teaching	

\* Letter grading ' '

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	Name	ID	School	E-mail
Person in charge	张荻	张荻 zhang		zhangdi@sjtu.edu.cn
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* ( ) Course Description	1. 2 3. 4. 5.			200

* English Course Description	Based on the teaching of composite materials related courses, this course further provides more cutting-edge and comprehensive professional education for graduate students in materials science and engineering. The focus of this course is to enable students to comprehensively and systematically understand the important basic concepts and theories of composite material preparation science, the preparation process, interface characteristics and structural design in composite material preparation research, as well as the development trend of composite materials, especially advanced composite materials. At the same time, students have the preliminary ability of composite material preparation research and design. It will lay a solid foundation for students to further study and specialized research in the field of composite materials in the future. Through learning, students will have the following abilities:  1. Master the basic laws of the relationship between the structure, composition, process, equipment, performance and application of composite materials;  2. Master the theoretical basis and experimental skills of composite material preparation and engineering research, development design and application, and have the ability of material design, structural design, process design and development of advanced composite materials and products;  3. Master the modern testing method of material microstructure and performance and the engineering testing technology of macro production process;  4. Master the forming and processing technology and equipment principle of composite materials;  5. Understand the frontier development information of composite materials;  6. Have strong self-study ability, engineering practice ability and certain innovation ability.
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Syllabus	1 2 3 1 2 2

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		MMC		
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5 6	in situ			
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	reinforcement phase)  5. Powder metallurgy (preparation process of metal matrix composite with discontinuous minforcement phase)
	reinforcement phase) 6. In situ growth (composite method)
	<ul><li>3 Interface and design of metal matrix composite</li><li>1. Interface of metal matrix composite</li></ul>
	2. Interface bonding of metal matrix composites
	3. Interface residual stress of metal matrix composite
	4 Properties of metal matrix composites
	1. General properties of metal matrix composites
	2. Properties of fiber reinforced metal matrix composites
	3. Properties of metal matrix composites reinforced by particles and whiskers Chapter 7 application and development of composite materials
	1 Application of composite materials
	1. Application of polymer matrix composites
	2. Application of metal matrix composite
	3. Application of ceramic matrix composite
	<ul><li>4. Carbon carbon composite</li><li>2 Development of composite materials</li></ul>
	Development of composite materials     Performance comparison of composite materials
	2. Development trend of composite materials
	Teaching progress:
	Introduction (4 class hours)
	Composite interface (2 class hours)
	Composite matrix (4 class hours) Composite reinforced phase (2 class hours)
	Composite theory and design of composite materials (2 class hours)
	MMC (10 class hours)
	Nonmetallic matrix composite materials (4 class hours)
*	Application and development of composite materials (4 class hours)  50
·	10% 40% 50%
Requirements	
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English	Class attendance (10%), experiment operation and homework (40%) and final paper (50%)
Requirements	
	<ol> <li>Polymer blends and composites by Manson, John A., New York: Plenum Press, 1976</li> <li>The theory of composites by Milton, Graeme Walter New York: Cambridge University Press, 2001.</li> </ol>
	3. Handbook of ceramics and composites by Cheremisinoff, Nicholas P. New York: M.
*	Dekker, 1990 4. Metal matrix composites. by Society of Automotive Engineers Warrendale, PA: Society of
	Automotive Engineers, 1994
Resources	5. Introduction to metal matrix composite materials. by Schoutens, Jacques E., Tempo,
	Kaman. Santa Barbara, Calif.: MMCIAC, 1982
	6. 1998 7. 2000
	8. 2004
	9. < > 1999
	1. Polymer blends and composites by Manson, John A., New York: Plenum Press, 1976
	2. The theory of composites by Milton, Graeme Walter New York: Cambridge University
*	Press, 2001. 3. Handbook of ceramics and composites by Cheremisinoff, Nicholas P. New York: M.
English	Dekker, 1990
Resources	4. Metal matrix composites. by Society of Automotive Engineers Warrendale, PA: Society of
	Automotive Engineers, 1994
	5. Introduction to metal matrix composite materials. by Schoutens, Jacques E., Tempo, Kaman. Santa Barbara, Calif.: MMCIAC, 1982

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	<ul> <li>6. Introduction to ceramic matrix composite materials: Jia Chengchang, Li Wenxia, Guo Zhimeng, Zhao Jun Metallurgical Industry Press, 1998</li> <li>7. Composite material Wu Renjie, Tianjin University Press, 2000</li> <li>8. Advanced composite materials Lu Yun, Zhu Shijie, Ma mingtu, Pan Fusheng Mechanical Industry Press, 2004</li> <li>9. Structure and properties of composite materials Zou zuhui Science Press, 1999</li> </ul>
Note	

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