

# 上海交通大学研究生专业课程信息收集表

## Information Form for SJTU Graduate Profession Courses

课程基本信息 Basic Information				
<b>*课程名称</b> Course Name	(中文 Chinese) 复合材料界面			
	(英文 English) Interface of Composites			
<b>*学分</b> Credits	2	<b>*学时</b> Teaching Hours	32 (1 学分=16 课时)	
<b>*开课学期</b> Semester	春季学期 Spring	<b>*是否跨学期</b> Cross-semester?	否 No	跨 Spanning over 一个学期 Semesters (含夏季学期)。
<b>*课程类型</b> Course Type	专业基础课 Program Core Course	<b>*课程分类</b> Course Type	全日制课程 For full-time students	
<b>*课程性质</b> Course Category	专业课 Specialized Course	课程层次 Targeting Students	博士课程 Doctoral Level	
<b>*授课语言</b> Instruction Language	中文 Chinese	主要授课方式 Teaching Method	课堂教学 In class teaching	
<b>*成绩类型</b> Grade	等第制 Letter grading	主要考核方式 Exam Method	论文 Essay	
<b>*开课院系</b> School	材料科学与工程学院			
所属学科 Subject	材料学			
<b>负责教师</b> Person in charge	姓名 Name	工号 ID	单位 School	联系方式 E-mail
	吕维洁		材料科学与工程	luweijie@sjtu.edu.cn
课程扩展信息 Extended Information				
<b>*课程简介</b> (中文) Course Description	<p>(分段概述课程定位、教学目标、主要教学内容、先修课程等；不少于 200 字。)</p> <p>本课程是材料科学与工程学院复合材料专业研究生的一门专业课。本课程是研究复合材料界面的专业课程，涉及到复合材料最为关键的科学问题，界面的形成、界面特征及其对复合材料力学性能的影响规律，最终实现优化控制复合材料界面提高制备的复合材料性能。主要包括如下几个方面的内容：复合材料界面概念，复合材料界面微结构及其表征，界面结构特性对微观、宏观性能的影响，界面结构与复合材料组分的关系，复合材料界面的稳定性，复合材料界面反应及其控制途径，界面的优化设计和优化界面的有效途径。学习本课程后，使学生能够系统地了解复合材料界面的相关内容，从界面出发优化控制复合材料的微观结构和力学性能，进而优化设计复合材料，把复合材料相关的专业知识系统化，为其开展复合材料科学研究奠定基础。也可作为材料学院别的二级专业、力学等专业提供参考。</p>			
<b>*课程简介</b> (English) Course Description	<p>(须与中文一致，翻译请力求信达雅。)</p> <p>This course is a professional course for graduate students majoring in composite materials in School of Materials Science and Engineering. This course is the study of composite interfaces, involving the key scientific issues, like the formation and characteristics of interfaces, effect on the mechanical properties, and the optimizing control to improve the composite performance. The main contents include: the concept of composite interface, the microstructure and characterization of composite interface, effect of interface structure on micro and macro performance, the relationship between composite components and interface structure, the stability of interface, interface reaction and its control, the optimizing design of interface and effective optimization methods. After completing this course, students are expected</p>			

	to systematically grasp the specialized knowledge of composite interface, be able to control the microstructure and mechanical properties of composite materials based on interface optimization and finally optimally design composites. This course can also help students systematize the professional knowledge and lay the foundation of materials science research. It can also serve as a reference for other second-grade majors in SMSE and mechanic major.		
*教学大纲 (中文) Syllabus	(建议列表形式, 各列内容: 章节、主要内容、课时数、教学方式等)		
	教学内容 Content	授课学时 Hours	教学方式 Format
	介绍课程安排, 课程主要讲授内容, 考核内容等	2	讲授
	国家奖 PPT 讲授复合材料界面研究的内容、方法等	2	讲授
	复合材料界面微结构及其表征	4	讲授
	界面结构特性对微观、宏观性能的影响	4	讲授
	界面结构与复合材料组分的关系	4	讲授
	复合材料界面的稳定性	4	讲授
	复合材料界面反应及其控制途径	4	讲授
	界面的优化设计和优化界面的有效途径	4	讲授
	实验室, 了解钛基复合材料熔炼、等温锻造等工艺, 探讨工艺对性能的影响	2	参观
	上交小论文	2	

*教学大纲 (English) Syllabus	(须与中文一致, 翻译请力求信达雅。)		
	Content	Hours	Format
	Introduction: A general introduction to the course arrangement, the main lecture content, assessment content, etc.	2	Teaching
	Combined with the National Award PPT to teach the content and methods of composite interface research	2	Teaching
	Microstructure and characterization of composite interface	4	Teaching
	Effect of interface structure characteristics on micro and macro performance	4	Teaching
	Relationship between interface structure and composite material composition	4	Teaching
	Stability of composite interface	4	Teaching
	Interface reaction and its control method	4	Teaching
	Optimized design and effective ways to optimize interface	4	Teaching

	Visit the laboratory to understand melting, isothermal forging of titanium matrix composites and discuss the effect of manufacturing process on performance	2	visit and observe
	Submit papers	2	
*课程要求 (中文) Requirements	<p>(课程考核方式、考核标准等; 不少于 50 字)</p> <p>撰写相关研究报告一份, 报告虽不限字数, 但要求结合国内外发展动态, 结合自己科研实践撰写, 不是简单的综述报告, 要有自己的心得。最终结合课程参与情况综合评定成绩。</p>		
*课程要求 (English) Requirements	<p>(须与中文一致, 翻译请力求信达雅。)</p> <p>Write a relevant research report. The report does not limit the number of words, but it is required to write in conjunction with domestic and foreign developments and your own scientific research practice, not a simple summary report. Finally, the scores are comprehensively evaluated based on the course participation.</p>		
*课程资源 (中文) Resources	<p>(教材、教参、网站资料等。)</p> <p>复合材料界面, 化学工业出版社, 2010 年, 杨序纲          复合材料学, 化学工业出版社, 2011 年, 张以河          金属基复合材料设计引论, 科学出版社, 2016 年, 武高辉          复合材料技术, 化学工业出版社, 2018 年, 魏化震, 李恒春, 张玉龙          先进复合材料界面技术, 航空工业出版社, 2017 年, 张宝艳</p>		
*课程资源 (English) Resources	<p>(须与中文一致, 请力求信达雅。)</p> <p>Composite Material Interface, Chemical Industry Press, 2010, Xugang Yang          Composite Materials Science, Chemical Industry Press, 2011, Yihe Zhang          Introduction to Metal Matrix Composites Design, Science Press, 2016, Gaohui Wu          Composite Material Technology, Chemical Industry Press, 2018, Huazhen Wei, Hengchun Li, Yulong Zhang          Interface Technology of Advanced Composite, Aviation Industry Press, 2017, Baoyan Zhang</p>		
备注 Note			