## 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								
*课程名称	(中文 Chinese) 焊接冶金							
Course Name	(英文 English) Welding Metallurgy							
*学分	2		*学时	32(1 学分=16 课时)				
Credits *开课学期			Teaching Hours *是否跨学期	路 Spanning over 个学期				
Semester	秋季学期 Fall		Cross-semester?	否 No Semesters (含夏季学期)。				
*课程类型 Course Type	专业前沿课 Program Frontier Course		r *课程分类 Course Type	全日制课程 For full-time students				
*课程性质 Course Category	专业课 Specialized Course		课程层次 Targeting Students	硕士课程 Master Level				
*授课语言 Instruction Language	中文 Chinese		主要授课方式 Teaching Method	课堂教学 In class teaching				
*成绩类型 Grade	等第制 Letter g	grading	主要考核方式 Exam Method	论文 Essay				
*开课院系 School	材料科学与工程学院							
所属学科 Subject	材料科学与工程	呈						
负责教师	姓名 Name	工号 ID	单位 School	联系方式 E-mail				
Person in charge	何国		材料学院	ghe@sjtu.edu.cn				
	_	课程扩展信	息 Extended Informat	tion				
	(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。)							
*课程简介 (中文) Course Description	该课程的任务是阐述金属材料,特别是比较重要的焊接结构典型材料,例如低合金高强钢、不锈钢、镍基合金、铝合金等,在焊接过程中物理冶金、 化学冶金和力学冶金的基本规律,揭示材料焊接过程中组织与相的转变规律与机制,分析材料焊接过程中缺陷的形成机制与预防措施,各种材料的焊接性,焊接工艺的制定及焊接接头质量检测等内容。通过该课程教学,使学生了解和掌握关键焊接结构材料的焊接性,焊接冶金的基本规律和组织相变机制;具有针对特定材料制定焊接工艺的能力;具有针对特定材料焊接缺陷的分析能力;并能够从焊接冶金的角度找到解决焊接缺陷的途径。							
	(须与中文一致,翻译请力求信达雅。)							
*课程简介 (English) Course Description	The purpose of this course is to elaborate on the principles of physical metallurgy, chemical metallurgy and mechanical metallurgy of the metallic materials in the welding process, including the microstructure and phase transition, the formation of the welding defects, weldability, welding procedure, weld inspection, etc. The focus will be put on the low alloy high strength steel, stainless steel, nickel based alloy, aluminum alloy, etc. The aim of this course is to enable students to understand and master the weldability of materials in some key welding structures, the basic law of welding metallurgy, and the mechanism of the microstructure and phase transition in the welding process. After the teaching, the students will have the ability to design welding structure and develop welding process for the specified materials, to analyze the welding defects for particular material, and to find the way to solve the welding problems by utilizing the knowledge of the welding metallurgy.							

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	(建议列表形式,各列内容:章节、主要内容、课时数、教学方式等)						
*教学大纲 (中文) Syllabus	<ul> <li>焊接冶金背景 学时数: 2</li> <li>焊接材料冶金 学时数: 2</li> <li>焊接过程化学反应 学时数: 2</li> <li>焊接冶金流动行为 学时数: 1</li> <li>焊接过程应力变形 学时数: 1</li> <li>焊缝区冶金行为 学时数: 8</li> <li>部分熔化区冶金 学时数: 6</li> <li>热影响区行为 学时数: 6</li> <li>课程总结考核 学时数: 4</li> </ul>						
	(须与中文一致,翻译请力求信达雅。)						
*教学大纲 (English) Syllabus	<ul> <li>Background</li> <li>Welding material metallurgy</li> <li>Chemical reaction during welding process</li> <li>Flow behavior during welding process</li> <li>Stress deformation during welding process</li> <li>Metallurgical behavior in weld zone</li> <li>Metallurgical behavior in Partial melting zone</li> <li>Metallurgical behavior in heat-affected zone</li> <li>Summary &amp; Assessment</li> <li>period: 2 hours</li> <li>period: 1 hours</li> <li>period: 8 hours</li> <li>period: 6 hours</li> <li>period: 6 hours</li> <li>period: 4 hours</li> </ul>						
	(课程考核方式、考核标准等;不少于50字)						
*课程要求 (中文) Requirements	考核包括撰写文献综述和课堂 Presentation,具体要求是: 文献综述:针对焊接冶金不同的领域或研究目标(统一命题)查找并阅读文献,包括问题提炼、重点关注研究思路及研究实验设计、研究进展等,撰写文献综述。 课堂 Presentation:针对撰写的文献综述内容,做 15-25 分钟的 Presentation。						
*课程要求 (English) Requirements	(须与中文一致,翻译请力求信达雅。)  Examination includes writing literature review and classroom presentation. Literature review: Searching and reading welding metallurgy literatures for finding problems existed and focusing on research ideas, experimental design, and research progress, etc. After then, writing a literature review.  The class presentation: Each student gives 15-25 minutes of presentation for the literature review.						
*课程资源 (中文) Resources	(教材、教参、网站资料等。)  1. 柯伸道著,闫久春等译,焊接冶金学(第二版)高等教育出版社,2012.  2. 张文钺 主编,焊接冶金学(基本原理),机械工业出版,2014.  3. John C. Lippold. Welding metallurgy and weldability, Wiley, 2014.  4. John C. Lippold, Damian J. Kotecki. Welding metallurgy and weldability of stainless steel, Wiley, 2005.  5. John N. DuPont, John C. Lippold, Samuel D. Kiser. Welding metallurgy and weldability of nickel-base alloys, Wiley, 2009.						
*课程资源 (English) Resources	<ol> <li>(须与中文一致,请力求信达雅。)</li> <li>Sindo Kou. Welding metallurgy, in Chinese, translated by Yan J. Higher Education Press, 2012.</li> <li>Zhang W. Welding metallurgy (fundamental), in Chinese, Machinery Industry Press, 2014.</li> <li>John C. Lippold. Welding metallurgy and weldability, Wiley, 2014.</li> <li>John C. Lippold, Damian J. Kotecki. Welding metallurgy and weldability of stainless steel, Wiley, 2005.</li> <li>John N. DuPont, John C. Lippold, Samuel D. Kiser. Welding metallurgy and weldability of nickel-base alloys, Wiley, 2009.</li> </ol>						

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备注		
Note		

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