

# 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) 功能材料的物理性能			
	(英文 English) Fundamentals of Functional Materials			
<b>*学分</b> Credits	3	<b>*学时</b> Teaching Hours	48 (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 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	通用课程 Both full & part time students	
<b>*课程性质</b> Course Category	专业课 Specialized Course	课程层次 Targeting Students	硕博共用 All graduates	
<b>*授课语言</b> Instruction Language	英文 English	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	口试 Oral exam	
<b>*开课院系</b> School	材料科学与工程学院			
所属学科 Subject				
<b>负责教师</b> Person in charge	姓名 Name	工号 ID	单位 School	联系方式 E-mail
	邓涛		材料科学与工程学院	dengtao@sjtu.edu.cn
课程扩展信息 Extended Information				
<b>*课程简介</b> (中文) Course Description	(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>本课程包括功能性材料的各种物理性质，包括电学、磁学、光学和热学性质的基本理论、特性和应用。本课程的主题是运用量子力学理论阐明光、电、磁、热性质的本质。本课程将帮助学生进一步了解功能材料的性能与结构之间的关系。基于对功能材料基本原理的理解，学生不仅能掌握材料的光学、电学、磁学和热学性质的含义、原理、评价和设计方法，而且能掌握材料的物理性质和结构之间的关系。此外，本课程将训练研究生科学地研究功能材料的物理性质。该课程还将为学生提供了解材料科学和工程领域最新研究的机会。</p>			
<b>*课程简介</b> (English) Course Description	(须与中文一致，翻译请力求信达雅。)			
	<p>This course covers the fundamental theories, characterizations and applications of various physical properties of functional materials including electrical, magnetic, optical and thermal properties. Topics in this course illustrate the essences of optical, electrical, magnetic and thermal properties by applying theory of quantum mechanics. This course will help student further understand the relationship between performance and structure of functional materials. Based on the understanding of the fundamentals of functional materials, the students will grasp not only the meaning, principle, evaluation and designing method of optical, electrical, magnetic and thermal properties of materials, but also the relationship</p>			

	between the physical properties and structures of materials. Additionally, the course will train the graduate students to study the physical properties of functional materials scientifically. The course will also offer the opportunities for students to know state-of-the-art researches in the materials science and engineering field.																												
*教学大纲 (中文) Syllabus	<p>(建议列表形式, 各列内容: 章节、主要内容、课时数、教学方式等)</p> <table border="1"> <thead> <tr> <th>教学内容</th> <th>授课学时</th> <th>教学方式</th> <th>授课教师</th> </tr> </thead> <tbody> <tr> <td>第一部分: 引言与材料表面性能介绍</td> <td>4</td> <td>讲课</td> <td>邓涛</td> </tr> <tr> <td>第二部分: 材料的光学性能</td> <td>10</td> <td>讲课</td> <td>宋成轶</td> </tr> <tr> <td>第三部分: 材料的热学性能</td> <td>10</td> <td>讲课</td> <td>宋成轶</td> </tr> <tr> <td>第四部分: 材料的电学性能</td> <td>10</td> <td>讲课</td> <td>邬剑波</td> </tr> <tr> <td>第五部分: 材料的磁学性能</td> <td>10</td> <td>讲课</td> <td>邬剑波</td> </tr> <tr> <td>第六部分: 期末考试</td> <td>4</td> <td>考试</td> <td>邓涛、邬剑波、宋成轶</td> </tr> </tbody> </table>	教学内容	授课学时	教学方式	授课教师	第一部分: 引言与材料表面性能介绍	4	讲课	邓涛	第二部分: 材料的光学性能	10	讲课	宋成轶	第三部分: 材料的热学性能	10	讲课	宋成轶	第四部分: 材料的电学性能	10	讲课	邬剑波	第五部分: 材料的磁学性能	10	讲课	邬剑波	第六部分: 期末考试	4	考试	邓涛、邬剑波、宋成轶
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*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> <ol style="list-style-type: none"> <li>1. 作业 (30%);</li> <li>2. 课堂测试及课堂表现 (30%);</li> <li>3. 期末考试 (40%)</li> </ol>																												

<p>*课程要求 (English) Requirements</p>	<p>(须与中文一致, 翻译请力求信达雅。)</p> <p>1.Home assignments (30%); 2.Quizzes and activity (30%); 3.Final term presentation (40%).</p>
<p>*课程资源 (中文) Resources</p>	<p>(教材、教参、网站资料等。)</p> <p>1) J. Simmons, K. S. Potter, <i>Optical Materials</i>, Academic Press, 1999 2) R. E. Hummel, <i>Electronic Properties of Materials</i>, Springer, 1985 R. C. O’Handley, <i>Modern Magnetic Materials: Principle and Applications</i>; John Wiley &amp; Sons Inc, 2000.</p>
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<p>备注 Note</p>	