

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 Course Name	(中文 Chinese) 材料研究方法论			
	(英文 English) Methodology of material research			
*学分 Credits	2	*学时 Teaching Hours	32 (1 学分=16 课时)	
*开课学期 Semester	秋季学期 Fall	*是否跨学期 Cross-semester?	否 No	跨 Spanning over 一个学期 Semesters (含夏季学期)。
*课程类型 Course Type	专业选修课 Program Elective Course	*课程分类 Course Type	通用课程 Both full & part time students	
*课程性质 Course Category	专业课 Specialized Course	课程层次 Targeting Students	硕博共用 All graduates	
*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 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			
负责教师 Person in charge	姓名 Name	工号 ID	单位 School	联系方式 E-mail
	王俊		材料科学与工程学院	junwang@sjtu.edu.cn
课程扩展信息 Extended Information				
*课程简介 (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>材料科学与工程专业的研究生经过了本科阶段的学习，虽然已经具备了初步的基础知识，但是对于如何开展学术研究，包括如何查阅文献、如何选题、如何运用科学的试验方法，以及如何撰写学术论文等，都还普遍缺乏必要的概念和条理性知识，极易导致后续走弯路，影响其研究的进展和论文的质量，为此本课程将通过系统剖析科学研究的基本过程与方法，包括材料研究的基础共性问题，即材料研究的性能论、结构论、过程论和能量论，结合材料科学研究的自身特点及前人提炼出的重要研究方法，并将材料科学与工程领域发展的最新成果所采用的新方法新思想相融合，如生态材料学、材料基因组、TRIZ 等创新方法与 MSA 与数据分析等在材料研究中的应用等，为研究生全面了解和掌握科学研究方法，提升思维能力、建立科学的研究方法体系提供必要的帮助和系统的指导。</p>			
*课程简介 (English) Course Description	<p>The graduate students of the major of materials science and engineering have been studying at the undergraduate level, although it has already acquired basic knowledge, but it is still generally lacking in how to carry out academic research, including how to make the literature search, how to choose the research topic, how to use the scientific test methods, and how to write the academic papers. Conceptual and methodical knowledge will easily lead to a subsequent curve, affecting the progress of the research and the quality of the paper. For this purpose, this course will systematically analyze the basic processes and methods of scientific research, including the basic common problems of material research, namely, the performance theory, structure theory, process theory and energy theory of</p>			

	<p>material research. The characteristics of materials scientific research and the important research methods extracted by the predecessors and the new methods and new ideas adopted by the latest achievements in the development of the field of material science and engineering, such as the innovation of ecological materials, material genome, TRIZ and the application of MSA and data analysis in the research of material and so on, are comprehensive for graduate students. Through this course, It is necessary to understand and master scientific research methods, enhance thinking ability, and establish scientific research method system.</p>
<p>*教学大纲 (中文) Syllabus</p>	<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> <p>科学研究的一般过程: 情报检索与文献阅读 2 课时 授课</p> <p>科学研究的一般过程: 选题 2 课时 授课</p> <p>科学研究的一般过程: 观察与分析 2 授课</p> <p>材料研究的性能论 3 课时 授课</p> <p>材料研究的结构论 3 课时 授课</p> <p>材料研究的过程论 3 课时 授课</p> <p>材料研究的能量论 3 课时 授课</p> <p>生态材料学的基本思想 2 课时 授课/研讨</p> <p>实验设计方法 2 课时 授课/研讨</p> <p>MSA 与实验数据分析 2 授课/研讨</p> <p>过程控制与评价 2 课时 授课/研讨</p> <p>基因组发展与材料研究 2 课时 授课/研讨</p> <p>TRIZ、反求与创新 2 课时 授课/研讨</p> <p>课程考查 2 课时 笔试</p>
<p>*教学大纲 (English) Syllabus</p>	<p>(须与中文一致, 翻译请力求信达雅。)</p> <p>General process of scientific research: information retrieval and literature reading: 2 class hours</p> <p>General process of scientific research: topic selection, 2 class hours</p> <p>General process of scientific research: observation and analysis, 2 class hours</p> <p>Performance theory of material research, 3 class hours</p> <p>Structure theory of material research, 3 class hours</p> <p>Process theory of material research, 3 class hours</p> <p>Energy theory of material research, 3 class hours</p> <p>Basic ideas of ecological materials: 2 class hours / discussion</p> <p>Experiment design method, 2 class hours teaching / discussion</p> <p>MSA and experimental data analysis, 2 class hours teaching / discussion</p> <p>Discussion of process control and evaluation, 2 class hours teaching /</p> <p>Genome development and material research, 2 class hours teaching / discussion</p> <p>TRIZ, reverse engineering and innovation, 2 class hours teaching / discussion</p> <p>Course examination</p>

<p>*课程要求 (中文) Requirements</p>	<p>(课程考核方式、考核标准等; 不少于 50 字) 课程论文两篇、专题研讨、课程实操、研讨交流频次与质量</p>
<p>*课程要求 (English) Requirements</p>	<p>(须与中文一致, 翻译请力求信达雅。) Two course essays, special topic discussion, course practice, frequency and quality of discussion</p>
<p>*课程资源 (中文) Resources</p>	<p>(教材、教参、网站资料等。) 《材料学的方法论》 《科学研究的艺术-科学方法导论》 《材料创造发明学》</p>
<p>*课程资源 (English) Resources</p>	<p>(须与中文一致, 请力求信达雅。) Methodology of materialogy An introduction to scientific method -the art of scientific research Theory & method of crearting and inventing on material</p>
<p>备注 Note</p>	