上海交通大学研究生课程开设申请表
New Graduate Course Application Form, SJTU

<table>
<tr><th colspan="6">课程基本信息 Basic Information</th></tr>
<tr><td>*课程名称
Course Name</td><td colspan="5">（中文 Chinese）碳基材料制备与应用
（英文 English）Preparation and Application of Carbon-Based Composite Materials</td></tr>
<tr><td>*学分
Credits</td><td>2</td><td>*总学时
Teaching Hours</td><td colspan="3">32（1 学分≥16 课时）</td></tr>
<tr><td>*开课季节
Semester</td><td>春季学期 Spring</td><td>*是否跨学期
Cross-semester?</td><td>否 No</td><td colspan="2">跨 Spanning over 个学期
Semesters（含夏季学期）。</td></tr>
<tr><td>*课程性质
Course Nature</td><td>专业课 Specialized Course</td><td>*课程分类
Course Type</td><td colspan="3">全日制课程 For full-time students</td></tr>
<tr><td>*课程类别
Course Category</td><td>专业选修课 Specialized Elective Course</td><td>*课程层次
Course Level</td><td colspan="3">硕博共用 For All Graduates</td></tr>
<tr><td>*授课语言
Instruction Language</td><td>中文 Chinese</td><td>*主要上课方式
Teaching Method</td><td colspan="3">课堂教学 In class teaching</td></tr>
<tr><td>*成绩记录方式
Grade</td><td>等级制 Letter grading</td><td>*主要考试类型
Exam Method</td><td colspan="3">考查 Tests</td></tr>
<tr><td>*开课单位
School</td><td colspan="5">材料学院</td></tr>
<tr><td>所属一级学科
Subject</td><td colspan="5">材料科学与工程</td></tr>
<tr><td rowspan="2">负责教师
Person in charge</td><td>姓名 Name</td><td>工号 ID</td><td>单位 School</td><td colspan="2">联系方式 E-mail</td></tr>
<tr><td>张耀中</td><td></td><td>材料学院</td><td colspan="2">zhangragnar@sjtu.edu.cn</td></tr>
<tr><th colspan="6">课程扩展信息 Extended Information</th></tr>
<tr><td>*课程简介
(中文)
Course Description</td><td colspan="5">（分段概述课程定位、教学目标、主要内容、先修课程等；不少于 200 字。）
课程涵盖了经典碳材料制备方法与性能研究，包括富勒烯、碳纳米管、石墨烯、金刚石、碳纤维等，同时介绍了相关的碳基复合材料体系的前沿应用与现存问题。通过课程学习，启发学生对于碳基复合材料应用的思考，促进多学科交叉的创新思维的培养，为解决复杂的科学问题提供新视角新思路。课程包含的碳基复合材料的设计、制备、以及分析表征手段，对学生的相关研究工作具有指导借鉴意义。先修课程建议材料科学基础、材料力学、材料加工原理等。</td></tr>
<tr><td>*课程简介
（English）
Course Description</td><td colspan="5">（须与中文一致，翻译请力求信达雅。）
The course covers the preparation methods and performance research of classic carbon materials, including fullerene, carbon nanotubes, graphene, diamond, carbon fibers, etc. At the same time, it introduces the cutting-edge applications and existing problems of related carbon based composite material systems. Through course learning, inspire students to think about the application of carbon based composite materials, promote the cultivation of interdisciplinary innovative thinking, and provide new perspectives and ideas for solving complex scientific problems. The course covers the design, preparation, and analytical characterization methods of carbon based composite materials, which have guiding and reference significance for students' related research work. The recommended prerequisite courses include Fundamentals of Materials Science, Mechanics of Materials, and Principles of Material Processing.</td></tr>
<tr><td>*教学大纲
(中文)
Syllabus</td><td colspan="5">（建议列表形式，各列内容：章节、主要内容、课时数、教学方式）
<table>
<tr><th>章节</th><th>主要内容</th><th>课时数</th><th>教学方式</th><th>章节是否有课程思政内容。如有，请详述</th></tr>
<tr><td>1</td><td>碳基材料概论：碳材料的发现、分类、发展现状与应用领域</td><td>2</td><td>课堂教学</td><td></td></tr>
<tr><td>2</td><td>典型零维碳基材料：富勒烯</td><td>2</td><td>课堂教学</td><td></td></tr>
</table></td></tr>
</table>

	等典型零维碳材料的制备与性能，碳基复合材料的制备科学、表征技术、以及应用与挑战			
3	典型一维碳基材料：碳纳米管等典型一维碳材料的制备与性能，碳基复合材料的制备科学、表征技术、以及应用与挑战	6	课堂教学	
4	典型二维碳基材料：石墨烯等典型二维碳材料的制备与性能，碳基复合材料的制备科学、表征技术、以及应用与挑战	6	课堂教学	
5	典型三维碳基材料：金刚石等典型三维碳材料的制备与性能，碳基复合材料的制备科学、表征技术、以及应用与挑战	8	课堂教学	
6	其他碳基材料：碳纤维等其他典型碳材料的制备与性能，碳基复合材料的制备科学、表征技术、以及应用与挑战	6	课堂教学	
7	课程考核：分组展示及总结报告	2	课堂教学	

*教学大纲（English）Syllabus

（须与中文一致，翻译请力求信达雅。）

Chapter	Main Contents	Hours	Teaching Style	Whether there is ideological and political content
1	Introduction to carbon-based materials: Discovery, classification, development status and application fields	2	In classroom	
2	Zero dimensional carbon-based materials: Preparation and properties of typical zero dimensional carbon materials such as fullerene, preparation science, characterization technology, and application of carbon-based composite materials	2	In classroom	
3	One-dimensional carbon-based materials: Preparation and performance of typical one-dimensional carbon materials such as carbon nanotubes, preparation science, characterization technology, application and challenges of carbon-based composite materials	6	In classroom	
4	Two-dimensional	6	In	

		carbon-based materials: Preparation and performance of typical two-dimensional carbon materials such as graphene, preparation science, characterization technology, application and challenges of carbon-based composite materials		classroom	
	5	Three-dimensional carbon-based materials: Preparation and performance of typical three-dimensional carbon materials such as diamonds, preparation science, characterization technology, application and challenges of carbon-based composite materials	6	In classroom	
	6	Other carbon-based materials: Preparation and performance of other typical carbon materials such as carbon fibers, preparation science, characterization technology, application and challenges of carbon-based composite materials	8	In classroom	
	7	Course exam: Group presentation and final report	2	In classroom	

*课程要求（中文）Requirements	（课程考核方式、考核标准等；不少于 50 字） 依据自选或指定应用场景，以小组形式 PPT 汇报新材料的研发和表征方法，并以研究论文形式，以小组为单位提交研究汇总报告
*课程要求（English）Requirements	（须与中文一致，翻译请力求信达雅。） Report on the research methods of new materials in a small group PPT based on self selected or specified application scenarios, and submit a research summary report in the form of a research paper in groups
*课程资源（中文）Resources	（教材、教参、网站资料等。） https://www.lib.sjtu.edu.cn/f/main/index.shtml
*课程资源（English）Resources	（须与中文一致，请力求信达雅。） https://www.lib.sjtu.edu.cn/f/main/index.shtml