

课程基本信息

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*课程名称 Course Name	(中文 Chinese) X			
	(英文 English) X-ray Diffraction Principles and Application			
*学分 Credits	2	*学时 Teaching Hours	32	
*开课学期 Semester	秋季学期 Fall	*是否跨学期 Cross-semester?	否 No	跨 Spanning over 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	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 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
	姜传海		材料学院	Chjjiang@sjtu.edu.cn
课程扩展信息				
*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>本课程可以为材料科学与工程学科或其他应用 X 射线衍射进行晶体结构分析学科的研究生开设的专业选修课。本课程主要介绍 X 射线物理学基础、X 射线衍射方向、X 射线衍射强度、X 射线衍射方法、多晶物相分析、晶体结构与点阵参数分析、应力测量与分析、衍射谱线形分析、多晶织构测量和单晶定向。教学目的是使学生掌握相关知识和技能，具体包括：</p> <ol style="list-style-type: none"> 1) 掌握各类 X 射线衍射分析方法与技术； 2) 掌握 X 射线衍射分析在材料领域中的应用； 3) 了解 X 射线衍射分析的最新趋势与发展方向； 4) 实验操作案例学习； 5) 获得必要的科研技能 			
*课程简介 (English) Course Description	<p>(须与中文一致，翻译请力求信达雅。)</p> <p>This is an elective course for graduate students in materials science and engineering or other disciplines that apply X-ray diffraction to crystal structure analysis. This course focuses on the basic principles, characteristics and applications of diffraction methods, including X-ray physics, X-ray diffraction</p>			

	<p>directions, X-ray diffraction intensity, X-ray diffraction methods, polycrystalline phase analysis, crystal structure, lattice parameter analysis, stress measurement and analysis, diffraction line shape analysis, polycrystalline texture measurement and single crystal orientation. The purpose of this course is to enable students to acquire the following knowledge and skills:</p> <ol style="list-style-type: none"> 1) To master various X-ray diffraction analysis methods and techniques; 2) To apply X-ray diffraction analysis in the field of materials; 3) To understand the latest trends and developments in X-ray diffraction analysis; 4) Experimental operation case training; 5) To obtain necessary scientific research skills. 		
<p>*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)		
	X	X	4
	X	X	4 /
			6 / /
			6
			6 /
			4
			2

*教学大纲 (English) Syllabus	(须与中文一致, 翻译请力求信达雅。)		
	Content	Hours	Format
	Fundamentals of X-ray physics, X-ray diffraction direction	4	lecture
	X-ray diffraction intensity X-ray diffraction direction	4	lecture/exercise
	Polycrystalline phase analysis, crystal structure and lattice parameter analysis	6	lecture/discussion/exercise
	Stress measurement and analysis, diffraction spectrum linear analysis	6	lecture
	Polycrystalline texture measurement, single crystal orientation	6	lecture/discussion
	Experiment operation	4	experiment
	Class discussion	2	discussion
*课程要求 (中文) Requirements	(课程考核方式、考核标准等; 不少于 50 字) 本课程将采用课程论文和综述大作业两种方式对学生的学习质量进行考核, 重点考察学生在学习过程中对相关知识点的掌握程度以及用于具体理论解决实际问题的能力。		
*课程要求 (English) Requirements	(须与中文一致, 翻译请力求信达雅。) The outcome of students in this course will be examined by means of course papers and summary assignments, focusing mainly on the students' mastery of relevant knowledge points in the learning process and their ability to solve practical problems with specific theories.		
*课程资源 (中文) Resources	(教材、教参、网站资料等。) <ul style="list-style-type: none"> ➤ 《X射线晶体学基础》, 梁栋材著, 科学出版社 ➤ 《X射线衍射分析技术》, 晋勇等著, 国防工业出版社 ➤ 《X射线晶体学 晶体结构分析基本理论及实验技术》, 马喆生、施倪承著, 中国地质大学出版社 ➤ 《近代X射线多晶体衍射 实验技术与数据分析》, 马礼敦著, 化学工业出版社出版 ➤ 《多晶材料X射线衍射: 实验原理、方法与应用》, 黄继武, 李周编著, 冶金工业出版社 ➤ 《结构化学基础》, 周公度、段连运编著, 北京大学出版社 		
*课程资源 (English) Resources	(须与中文一致, 请力求信达雅。) <ul style="list-style-type: none"> ➤ <i>Fundamentals of X ray crystallography</i>. Liang Dongcai. Science press ➤ <i>X-ray diffraction analysis technology</i>. Jin Yong et al., National defense industry press ➤ <i>X-ray crystallography: basic theory and experimental techniques for crystal</i> 		

	<p><i>structure analysis</i>. Ma Zhesheng and Shi Nicheng. China university of geosciences press</p> <p>➤ <i>Modern X-ray polycrystal diffraction: experimental techniques and data analysis</i>. Ma Lidun. Chemical industry press</p> <p>➤ <i>X-ray diffraction of polycrystalline materials: experimental principles, methods and applications</i>. Huang Jiwu and Li Zhou, Metallurgical industry press</p> <p>➤ <i>Fundamentals of structural chemistry</i>. Zhou Gongdu and Duan Lianyun, Peking University press</p>
备注 Note	