

## 课程大纲 COURSE SYLLABUS

1.	<b>课程代码/名称 Course Code/Title</b>	现代材料分析测试实验 Modern Materials Analysis and Testing Experiments
2.	<b>课程性质 Compulsory/Elective</b>	专业选修课 Specialized Elective Courses
3.	<b>开课单位 Offering Dept.</b>	材料科学与工程系 Department of Materials Science and Engineering
4.	<b>课程学分/学时 Course Credit/Hours</b>	2/64
5.	<b>授课语言 Teaching Language</b>	Bilingual
6.	<b>授课教师 Instructor(s)</b>	李艳艳、廖成竹、章剑波、王海鸥、李慧丽 Li Yanyan, Liao Chengzhu, Zhang Jianbo, Wang Haiou, Li Huili
7.	<b>开课学期 Semester</b>	春季和秋季 Spring and Fall
8.	<b>是否面向本科生开放 Open to undergraduates or not</b>	否 No
9.	<b>先修要求 Pre-requisites</b>	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) 无 No
10.	<b>教学目标 Course Objectives</b>	<p>(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)</p> <p>《现代材料分析测试实验》是材料科学与工程专业和材料与化工专业研究生的专业选修课程。课程通过一系列实验分析测试典型材料的形貌、结构及性能, 使学生掌握常用的材料分析测试方法和原理, 掌握相应的表征设备的基本操作和数据处理, 了解现代材料分析测试设备在科学研究中的重要应用, 为科研实践工作奠定良好的实践基础。</p> <p>"Modern Materials Analysis and Testing Experiments" is an elective course for postgraduates majored in Materials Science and Engineering or Materials and Chemical Engineering. Through a series of experiments for analyzing and testing the morphology, structure and properties of typical materials, the course enables students to master the commonly used material analysis and testing methods and principles, master the basic operations and data processing of the corresponding characterization equipment, understand the important applications of modern material testing and analysis equipment in scientific research, and lay a solid practical foundation for scientific research and practical work.</p>
11.	<b>教学方法 Teaching Methods</b>	

(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)

本课程为实验课程, 包括设备培训、设备操作和设备考核环节。设备培训主要为教师讲解, 微课介绍知识点及设备操作演示等; 设备操作为互动式、体验式教学, 学生动手实验, 教师指导; 设备考核为学生按照教师要求进行操作并考核。

This course is an experimental course, including equipment training, operation and assessment. Equipment training mainly includes teacher's explanation, micro class introduction of knowledge points and equipment operation demonstration. The equipment operation is interactive and experiential teaching, students' hands-on experiment combined with teacher guidance. Equipment assessment for students shall be operated and accessed according to teacher requirements.

## 12. 教学内容

### Course Contents

(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)

<b>Section 1</b>	Week 1: Introduction for the course
<b>Section 2</b>	Week 1-3: Fourier Transform Infrared Spectroscopy (FTIR)
<b>Section 3</b>	Week 4-6: Scanning Electron Microscope (SEM)
<b>Section 4</b>	Week 7-9: X-ray Diffraction (XRD)
<b>Section 5</b>	Week 10-12: Ultraviolet and Visible Spectrophotometer (UV-Vis)
<b>Section 6</b>	Week 13-16: Thermo Gravimetric Analysis and Differential Scanning Calorimetry (TGA and DSC)

## 13. 课程考核

### Course Assessment

(①考核形式 Form of examination; ②. 分数构成 grading policy; ③如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)

考勤 10%+设备培训 20%+设备操作 40%+设备考核 30%

Attendance 10% + Equipment training 20% + Equipment operation 40% + Equipment assessment 30%

## 14. 教材及其它参考资料

### Textbook and Supplementary Readings

(1) Yang Leng, Materials Characterization, Wiley-VCH, 2012.

(2) 何琴玉, 叶飞, 曾敏等, 凝聚态物质性能测试与数据分析. 北京: 化学工业出版社, 2022

(3) 唐杰主编. 2017.[M]. 北京: 化学工业出版社, 2017.

(4) 潘清林主编, 材料现代分析测试实验教程[M]. 北京: 冶金工业出版社, 2011.