國立台灣科技大學 114學年 第2學期 課程大綱

Spring 2026 NTUST Course Outline

授課教師：徐秀蘭

Instructor:HSU HSIU LAN

課程名稱：材料實驗(四)

Course Title：Materials Science and Engineering Laboratory (IV)

2026/11/4

課程代號： TX4218701 Course Code 學分數： 2 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室： Time/Location	F7(TR-313) F8(TR-313) F9(TR-313)
專業核心能力： Core Professional Competencies	■1.具備基礎科學與材料工程專業知識之整合、創新能力。 ■2.具備收集文獻、建構研究規劃、設計實驗流程與整合分析之能力。 ■3.具備執行專題研究、應用研究成果，以及口頭發表與報告撰寫之能力。 ■4.具備創新思考，並可獨立解決複雜性問題之能力。 ■5.具備良好團隊分工合作之能力。 ■6.具備語文能力及良好之國際觀，尊重多元價值觀點。 ■8.體認及實踐工程倫理與社會永續發展之觀念，具備終身自我學習與成長之能力。
課程網址： Course Website	non
課程宗旨： Course Objectives	Train students to understand and learn to use instruments to analyze various characteristics of materials in class, as well as how to conduct thermal analysis research on materials and the principles and operation methods of instruments. Understand the material structure and physical properties, and strengthen the analysis and understanding of material structure and quality.
課程大綱： Outline of Lectures	Train students to understand and learn to use instruments to analyze various characteristics of materials in the classroom, and how to conduct thermal analysis of materials and the principles and operating methods of instruments, personally operate instrument analysis, so as to hone their material analysis skills. Students in the course can learn from practical operations Understand the structure and physical properties of materials, and strengthen the analysis and understanding of the structure and quality of materials. Material instrument analysis experiment: EXP1. Principles of thermal analysis equipment (DSC,TGA) EXP2. Thermogravimetric Analyzer (TGA) EXP3. Thermal Differential Analyzer (DSC) EXP4. Principles of chromatography analysis equipment(GPC/APC/HPLC) EXP5. Gel permeation chromatography (APC/GPC) EXP6. Principles of material mechanical analysis(TMA/DMA/MCR) EXP7. Principles of Modular Compact Rheometer (MCR) EXP8. Principles of Gas Mass Spectrometer (GC-MS) EXP9. Gas Mass Spectrometer EXP10. Karl Fisher water determination EXP11. Polarizing microscope EXP12. Fluorescence Microscope
授課方式： Method of Instruction	講授 Lecture：40% 分組討論 Group discussion：10%

	案例研討 Case study：10% 操做練習 Practical exercises：40% 講授 Lecture：%
教科書： Textbooks	Experimental Course Handouts (PPT) & VCR
參考書目： References	Spectroscopy and Thermal Analysis in Materials
修課須知： Notice	no
評量方式： Grading	Attend class on time and attitude :30%, Equipment operation Practice : 30% Midterm and final report: 40%
備註說明： Notes	no