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：DWI FORTUNA ANJUSA PUTRA

Instructor:DWI FORTUNA ANJUSA PUTRA

課程名稱：材料分析

Course Title：Characterization of Materials

2026/11/3

課程代號： IS4115301 Course Code 學分數： 3 Credits	必選修：必修/半學年 Required/Electve:Required/Half Yr. 先修課程： Prerequisites
節次教室： Time/Location	R4(IB-506) W6(IB-506) W7(IB-506)
專業核心能力： Core Professional Competencies	■核心能力2.具備執行實驗與分析數據之能力。 ■核心能力3.具備材料工程技術與儀器操作之能力。 ■核心能力4.明瞭實際生產流程，具備材料設計、製造與跨域整合分析之能力。 ■核心能力5.培養團隊合作默契，具備專案管理及溝通協調能力。 ■核心能力6.具備發掘問題、邏輯分析、應用研究成果與因應複雜問題之能力。
課程網址： Course Website	https://moodle.ntust.edu.tw/
課程宗旨： Course Objectives	Introduction to the analysis principles and methods for material microstructure, physical properties, and chemical properties is the main purpose of this lecture. In addition, the students will be arranged to visit the corresponding instruments of materials characterization (e.g., scanning electron microscopy, transmission electron microscopy), which will effectively deepen students' impression of these instruments.
課程大綱： Outline of Lectures	1. X光繞射分析原理及方法 2. X光吸收光譜技術介紹 3. 掃瞄式電子顯微鏡介紹 4. 穿透式電子顯微鏡介紹 1. Introduction (Weeks 1 and 2) 2. Optical microscopy and scanning electron microscopy (Week 3) 3. Conventional transmission electron microscopy (Weeks 4 and 5) 4. High resolution transmission electron microscopy (Weeks 6 and 7) 5. Scanning transmission electron microscopy (Week 9) 6. Auger electron spectroscopy (Weeks 10 and 11) 7. X-ray photoelectron spectroscopy (Weeks 12 and 13) 8. Secondary ion mass spectrometer (Week 14) 9. Focused ion beam and electron backscatter diffraction (Week 15) 10. Special Topics (Weeks 17 and 18)
授課方式： Method of Instruction	講授 Lecture：30% 分組討論 Group discussion：35% 案例研討 Case study：0% 操做練習 Practical exercises：34% 講授 Lecture：%

教科書： Textbooks	Slides
參考書目： References	“Materials characterization”, edited by J. M. Wang, Materials Research Society-Taiwan, Hsinchu, New Jersey (1998) (ISBN: 957-98954-3-0) 2. “Material Electron Microscopy”, written by L. J. Chen, Materials Research Society-Taiwan, Hsinchu (1997) (ISBN: 957-00-4582-5)
修課須知： Notice	N.A.
評量方式： Grading	Midterm Exam and final : 35% 2.group discussion:35% 3.Attendance: 30%
備註說明： Notes	the class is using english