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：施劭儒

Instructor:Shao-Ju Shih

課程名稱：材料分析

Course Title：Characterization of Materials

2026/11/3

課程代號： TX4115302 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： R6(TR-511) R7(TR-511) W2(TR-511) Time/Location	
專業核心能力： Core Professional Competencies	
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.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：80% 分組討論 Group discussion：0% 案例研討 Case study：20% 操做練習 Practical exercises：0% 講授 Lecture：%
教科書： Textbooks	Slides
參考書目： References	1. “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	One teaching assistant is available.
評量方式： Grading	1.Midterm Exam : 30% 2.Final Exam:40% 3.Homework/Report:20% 4.Attendance: 10%

備註說明： Students need the English level of above CEFR B2, which is recommended. Notes