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：黃延吉

Instructor:Yan-Jyi Huang

課程名稱：X光及中子散射

Course Title：Methods of X-Ray and Neutron Scattering

2026/11/4

課程代號：CH5306701 Course Code 學分數：3 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室：R3(IB-410-2) R4(IB-410-2) W2(IB-509) Time/Location	
專業核心能力： Core Professional Competencies	
課程網址： Course Website	
課程宗旨： Course Objectives	Synopsis: The objective of this course is to acquaint students of science and engineering with the fundamental principles for methods of X-ray and neutron scattering and their applications. The topics to be covered include: (i)X-rays and their interaction with matter, (ii) sources of X-rays, (iii) refraction and reflection from interfaces, (iv) kinematical diffraction, and (v) diffraction by perfect crystals
課程大綱： Outline of Lectures	Schedule: Week 1 (2/25, 26, 26) X-rays and their interaction with matter (Als-Nielsen Chap. 1; Roe Chap. 1) Week 2 (3/4, 5, 5) Week 3 (3/11, 12,12) Sources (Als-Nielsen Chap. 2; Roe Chap. 2) Week 4 (3/18,19,19) Week 5 (3/25,26,26) Week 6 (4/1,2,2) Week 7 (4/8,9,9) 4/8 Midterm #1 (1 hr) Refraction and reflection from interfaces (Als-Nielsen Chap. 3; Roe Chap. 7) Week 8 (4/15,16,16) Week 9 (4/22,23,23) Week 10 (4/29,30,30) Kinematical diffraction I: non-crystalline materials (Als-Nielsen Chap. 4; Roe Chaps. 4 and 5) Week 11 (5/6,7, 7) 5/6 Midterm #2 (1 hr) Week 12 (5/13,14,14) Week 13 (5/20,21,21) Kinematical diffraction II: crystalline order (Als-Nielsen Chap. 5; Roe Chap. 3) Week 14 (5/27,28,28) Week 15 (6/3,4,4) Week 16 (6/10,11,11) Diffraction by perfect crystals (Als-Nielsen Chap. 6; Roe Chap. 3) 6/11 Final (2 hrs)
授課方式： Method of Instruction	講授 Lecture：100% 分組討論 Group discussion：0% 案例研討 Case study：0% 操做練習 Practical exercises：0%

	講授 Lecture：%
教科書： Textbooks	Textbook: J. Als-Nielsen, and D. McMorrow," Elements of Modern X-Ray Physics," 2nd Ed., Wiley, New York, 2011.
參考書目： References	Reference Books: (1) R.J. Roe," Methods of X-Ray and Neutron Scattering in Polymer Science," Oxford University Press, New York, 2000. (2) B.D. Cullity," Elements of X-ray Diffraction," 2nd Ed., Addison-Wesley Pub. Co., Reading, Mass., 1978. (Note: The 3rd ed. is not recommended.) (3) A. Guinier," X-Ray Diffraction in Crystals, Imperfect Crystals, and Amorphous Bodies," Dover Publications, Inc., New York, 1994. (4) O. Glatter and O. Kratky, Eds.," Small Angle X-Ray Scattering," Academic Press, N
修課須知： Notice	
評量方式： Grading	Grading: Two Midterms (Apr. 8；May 6)(40%), One Final Exam (June 11)(30%), and Homework and Final Report (30%) (Topics of term paper to be selected from Roe's Chaps. 3-7)
備註說明： Notes	