

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

2026/5/5

<p>課程代號： CH5306701 Course Code</p> <p>學分數： 3 Credits</p>	<p>必選修：選修/半學年 Required/Electve: Elective/Half Yr.</p> <p>先修課程： Prerequisites</p>
<p>節次教室： R3(IB-410-2) R4(IB-410-2) W2(IB-509) Time/Location</p>	
<p>專業核心能力： Core Professional Competencies</p>	
<p>課程網址： Course Website</p>	
<p>課程宗旨： Synopsis: Course Objectives</p> <p>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</p>	
<p>課程大綱： Schedule: Outline of Lectures</p> <p>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)</p>	
<p>授課方式： 講授 Lecture : 100% Method of Instruction</p> <p>分組討論 Group discussion : 0%</p> <p>案例研討 Case study : 0%</p> <p>操做練習 Practical exercises : 0%</p>	

講授 Lecture : %

教科書 : Textbook:  
Textbooks J. Als-Nielsen, and D. McMorrow, " Elements of Modern X-Ray Physics,"  
2nd Ed., Wiley, New York, 2011.

參考書目 : Reference Books:  
References (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