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：梁鍵隴

Instructor:Chien-Lung Lian

課程名稱：材料動力學與相變化

Course Title：Kinetics and Phase Transformation of Materials

2026/11/3

課程代號：TX3310302 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：F3(TR-409-2) F4(TR-409-2) T2(TR-409-2) Time/Location	
專業核心能力： Core Professional Competencies	
課程網址：https://moodle2.ntust.edu.tw/course/view.php?id=19489 Course Website	
課程宗旨： Course Objectives	As an extension of Materials Science (I) and (II), this course will explain the physical metallurgical behavior in metallic materials from three perspectives: processing, structures, and properties. It will introduce the fundamental principles of dislocations (Chapter 4 and Chapter 5), grain boundaries (Chapter 6), annealing phenomena (Chapter 8), solid solutions (Chapter 9), diffusion (Chapter 12), and precipitation (Chapter 16) using the classic textbook "Reed-Hill's Physical Metallurgy Principles." Students who take this course will learn more about material structures, how structures dictate properties, and how processing can change structures.
課程大綱： Outline of Lectures	The following schedule may be rearranged as needed. W1. Introduction to the Course W2. Introduction to Dislocations (Chapter 4) W3. Introduction to Dislocations (Chapter 4) W4. Dislocations and Plastic Deformations (Chapter 5) W5. Dislocations and Plastic Deformations (Chapter 5) + Quiz W6. Elements of Grain Boundaries (Chapter 6) W7. Elements of Grain Boundaries (Chapter 6) W8. Review for the midterm exam + Midterm exam W9. Annealing (Chapter 8) W10. Annealing (Chapter 8) W11. Annealing (Chapter 8) W12. Solid Solutions (Chapter 9) W13. Solid Solutions (Chapter 9) + Diffusion in Substitutional Solid Solutions (Chapter 12) W14. Diffusion in Substitutional Solid Solutions (Chapter 12) W15. Precipitation Hardening (Chapter 16) W16. Review for the final exam + Final exam
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	Reza. Abbaschian, Lara. Abbaschian, and Robert E. Reed-Hill, “Physical Metallurgy Principles,” 4th Edition, SI Edition, Cengage Learning
參考書目： References	William D. Callister, Jr. and David G. Rethwisch, "Callister's Materials Science and Engineering, 10th Edition," Global Edition, Wiley
修課須知： Notice	Office hours: Please feel free to email me anytime if you have questions.
評量方式： Grading	1. Attendance 20% (Survey on the random dates) 2. Quiz 20% (Open-book) 3. Midterm exam 30% (Closed-book) 4. Final exam 30% (Closed-book) Note 1: The questions for exams will 100% come from the ppt slides. Note 2: The questions will be expressed in English, but the solutions to the questions can be answered in Chinese. Note 3: The exam will be fundamental and straightforward. So, please don't cheat!
備註說明： Notes	NA