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：陳志堅

Instructor:Jyh-Chien Chen

課程名稱：高等高分子化學

Course Title：Advanced Polymer Chemistry

2026/11/3

課程代號： TX5023701 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： Time/Location　R2(TR-512) R3(TR-512) R4(TR-512)

專業核心能力： Core Professional Competencies

1.具備基礎科學與材料工程專業知識之整合、創新能力。
3.具備執行專題研究、應用研究成果，以及口頭發表與報告撰寫之能力。
4.具備創新思考，並可獨立解決複雜性問題之能力。

課程網址： Course Website

課程宗旨： Course Objectives

The objectives of this course are to introduce the chemistry involved from monomers to polymers (polymerization). The chemistry involved condensation, free radical anionic, cationic and coordination polymerization. In addition, click chemistry in polymerization will also be mentioned. Special focus will also be on precision polymerization and combination of different polymerization chemistry for structure design.

課程大綱： Outline of Lectures

1. Introduction to Polymer Chemistry
2. Condensation polymerization
3. Kinetics of Polycondensation
4. Chain-Growth Polycondensation
5. Free Radical Polymerization
6. Living Radical Polymerization
7. Anionic Polymerization
8. Group Transfer Polymerization
9. Coordination Polymerization
10. Cationic Polymerization
11. Click Chemistry for Polymerization
12. Combination of Various Synthesis Methods for Polymer Structure Design

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

	1. Lecture notes 2. Allcock, H. R.; Lampe, F. W.; Mark, J. E. “Contemporary Polymer Chemistry” 3rd Ed. Pearson Education, Inc.2003 3. Odian, G. “ Principles of Polymerization” 4th Ed. New York, Wiley-Interscience, 2004. 4. Hsieh, H. L.; Quirk, P. “Anionic Polymerization” New York, Marcel Dekker, 1996. 5. Kennedy, J. P.; Ivan, B. “Designed Polymers by Carbocationic Macromolecular Engineering: Theory and Practice” New York, Hanser, 1991. 6. Review articles in SCI journals.
參考書目： References	1. Lecture notes 2. Allcock, H. R.; Lampe, F. W.; Mark, J. E. “Contemporary Polymer Chemistry” 3rd Ed. Pearson Education, Inc.2003 3. Odian, G. “ Principles of Polymerization” 4th Ed. New York, Wiley-Interscience, 2004. 4. Hsieh, H. L.; Quirk, P. “Anionic Polymerization” New York, Marcel Dekker, 1996. 5. Kennedy, J. P.; Ivan, B. “Designed Polymers by Carbocationic Macromolecular Engineering: Theory and Practice” New York, Hanser, 1991. 6. Review articles in SCI journals.
修課須知： Notice	
評量方式： Grading	Midterm 50% Final 50%
備註說明： Notes	Organic Chemistry Thermodynamics Chemical Kinetics