

## 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

2026/6/22

課程代號：TX5023701 Course Code 學分數：3 Credits	必選修：選修/半學年 Required/Elective: Elective/Half Yr. 先修課程： Prerequisites
節次教室：R2(TR-512) R3(TR-512) R4(TR-512) Time/Location	
專業核心能力： Core Professional Competencies	
<ol style="list-style-type: none"> <li>1. 具備基礎科學與材料工程專業知識之整合、創新能力。</li> <li>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。</li> <li>4. 具備創新思考，並可獨立解決複雜性問題之能力。</li> </ol>	
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	<ol style="list-style-type: none"> <li>1. Introduction to Polymer Chemistry</li> <li>2. Condensation polymerization</li> <li>3. Kinetics of Polycondensation</li> <li>4. Chain-Growth Polycondensation</li> <li>5. Free Radical Polymerization</li> <li>6. Living Radical Polymerization</li> <li>7. Anionic Polymerization</li> <li>8. Group Transfer Polymerization</li> <li>9. Coordination Polymerization</li> <li>10. Cationic Polymerization</li> <li>11. Click Chemistry for Polymerization</li> <li>12. Combination of Various Synthesis Methods for Polymer Structure Design</li> </ol>
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