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：Hairus

Instructor:Hairus Abdullah

課程名稱：光觸媒半導體奈米材料

Course Title：Semiconductor Nanomaterials for Photocatalysis

2026/11/3

課程代號：TX5014701 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：T6(TR-615) T7(TR-615) T8(TR-615) Time/Location	
專業核心能力： Core Professional Competencies	1. Students can select and design materials for photocatalysis method 2. Understanding the preparation of nanomaterials to synthesize photocatalysts 3. Students can use their knowledge to work on photocatalysis field 4. Students have the ability design photocatalytic system for a specific purpose
課程網址： Course Website	
課程宗旨： Course Objectives	1. To understand the fundamental of photocatalysis method for oxidation and reduction reaction. 2. Understanding the photocatalysis method for a promising self-cleaning, environmental remediation system, energy source generation, and antibacterial agents. 3. To design a visible light driven nanomaterials for photocatalysis 4. Understanding the strategy to enhance photocatalytic yield for a specific purpose.
課程大綱： Outline of Lectures	

	1.光催化的納米材料的介紹 2.光催化的基本原理，機制和挑戰 3.納米複合材料及其在光催化中的重要性 4.金屬納米粒子及其表面電漿活性對納米複合材料中於可見光催化的作用 5.可見光催化的混合金屬氧化物納米複合材料 6.多孔納米複合材料應用於光催化反應 7.聚合物納米複合材料其可見光催化應用 8.碳基納米複合材料其可見光催化應用 9.具有碳質p-共軛/聚合物材料的g-C3N4納米複合材料於可見光催化應用 10.鈦基混合金屬氧化物納米複合材料其可見光催化應用 11.各種光催化劑合成方法及其測試方法。 12.納米複合材料的新應用和未來前景（案例研究） 1. Introduction of nanomaterials for photocatalysis 2. Basic principles, mechanisms, and challenges of photocatalysis 3. Nanocomposite and its importance in photocatalysis 4. Role of metal nanoparticles and its surface plasmon activity on nanocomposites for visible light-induced catalysis 5. Mixed metal-oxides nanocomposites for visible light-induced photocatalysis 6. Nanoporous nanocomposite materials for photocatalysis 7. Polymeric nanocomposites for visible-light-induced photocatalysis 8. Carbon-based nanocomposites for visible light-induced photocatalysis 9. Nanocomposites of g-C3N4 with carbonaceous p-conjugated/polymeric materials towards visible light-induced photocatalysts 10. Titanium-based mixed metal oxide nanocomposites for visible light-induced photocatalysis 11. Various kinds of synthesis methods to prepare photocatalysts and theirs testing methods. 12. Novel applications and future perspectives of nanocomposites (case study)
授課方式： Method of Instruction	講授 Lecture：50% 分組討論 Group discussion：0% 案例研討 Case study：50% 操做練習 Practical exercises：0% 講授 Lecture：%
教科書： Textbooks	Related published papers in high reputation journals
參考書目： References	Related published papers in high reputation journals
修課須知： Notice	There is no TA in this course
評量方式： Grading	Attendance = 10% Assignment (student notes) = 20% Mid-term (presentation) = 25% Final-term (presentation) = 35% Asking questions during presentation = 10%
備註說明： Notes	No requirements