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國立高雄科技大學
NATIONAL KAOHSIUNG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY
授課大綱 Syllabus

部別：日間部四技

112學年度第2學期

列印日期：2024/03/06

中文課程名稱：觸媒化學概論	英文課程名稱：Introduction of Catalysis	授課教師：潘俊仁
開課班級：四化材四乙	學分：2.0	授課時數：2.0
合班班級：四化材四甲		實習時數：0.0

1. 中文教學目標(Chinese Teaching objectives)

催化是化學工程的核心學科，在石油精煉、合成纖維和塑膠的製造、具有各種用途的許多不同化學品的生產、食品加工以及藥品和藥品的生產中都很重要。催化被認為是保護環境的綠色化學支柱。今日，催化對於可持續發展的世界至關重要，並且是在廣泛的清潔能源技術、產品和工藝中實現可持續發展目標的關鍵技術。催化有助於抑制大氣污染，設計環保技術，並尋求新的能源生產方式。為了與世界各地的專家交流並解決我們社會的可持續性問題，英語作為教學對化學工程專業的學生可能有益，對未來的化學工程師尤其重要。本課程的目的是以英文授課的方式簡要介紹催化化學的重要概念和基本原理，以及其在學術界和工業界的應用。

2. 英文教學目標(English Teaching objectives)

Catalysis is the core subject in chemical engineering and is important in the refinement of petroleum, in the manufacturing of synthetic fibers and plastics, in the production of many different chemicals with a variety of uses, in the processing of foods, and in the production of medicines and pharmaceuticals. Catalysis is considered a pillar of green chemistry in the preservation of our environment. Today, catalysis is essential for the development of a sustainable world and is a key technology in achieving the sustainability goals in a broad range of clean energy technologies, products, and processes. Catalysis helps in the suppression of atmospheric pollution, in the design of environmentally friendly technologies, and in the pursuit of new ways to generate energy. In order to communicate with the experts worldwide and to tackle the issue of the sustainability of our society, English as medium of instruction could be beneficial to students major in chemical engineering and especially essential for the future chemical engineers. The objective of this course is to utilized English as medium of instruction to briefly introduce the important concepts and fundamental principles of catalytic chemistry, as well as its applications in academia and industry.

3. 中文教學綱要(Chinese CourseDescription)

介紹多相催化的重要概念和催化反應的基本原理。包括以下內容：1. 簡介：催化劑的功能及其定義 2. 表面吸附現象 3. 催化反應動力學 4. 催化材料的製備方法 5. 催化材料的表徵技術 6. 催化材料在工業中的應用。 7. 催化材料在環境中的應用 8. 催化材料在能源科技中的應用 9. 催化材料在電化學技術中的應用

4. 英文教學綱要(English CourseDescription)

To give an introduce of the important concepts of heterogeneous catalysis and the basic principles of catalytic reactions. The following contents are included: 1. Introduction: functions of catalyst and its definition 2. Surface adsorption phenomena 3. Kinetics of catalytic reactions 4. The preparation methods of catalytic materials 5. The characterization techniques of catalytic materials 6. Application of catalytic materials in industry. 7. Application of catalytic materials in environments 8. Application of catalytic materials in energy devices 9. Application of catalytic materials in electrochemical technologies

5. 中文核心能力

核心能力名稱	核心能力百分比
1 基本的化學工程專業知識	15%
2 基本的材料工程專業知識	20%
3 化工材料之基本設計能力	5%

4	應用基礎數學與科學知識處理問題能力	5%
5	電腦輔助應用之能力	5%
6	溝通協調及團隊合作的能力	5%
7	重視職業倫理與敬業負責之工作態度	5%
8	閱讀英文書刊及基礎的表達及寫作能力	40%

6. 英文核心能力

	核心能力名稱	核心能力百分比
1	Primary Chemical Engineering Professionalism	15%
2	Primary Material Engineering Professionalism	20%
3	Basic design in chemical materials	5%
4	Problem solving in applied mathematics and scientific knowledge	5%
5	Computer literacy	5%
6	Communication, coordination and collaboration	5%
7	Professional ethics and dedication	5%
8	Competence in English reading and basic writing	40%

無教科書資料。

8. 參考書

中文書名：觸媒化學概論與應用 英文書名：Essence of Heterogeneous Catalysis and Applications
 中文作者：雷敏宏&吳紀聖著 英文作者：
 1 中文出版社：五南出版 英文出版社：
 出版日期：2014年 04月 備註：

9. 教學進度表

週次或項目 Week or Items	中文授課內容 Chinese Course Content	英文授課內容 English Course Content	分配節次 Assigned Classes	備註 Note
WEEK1	簡介：催化劑的功能及其定義	Introduction: functions of catalyst and its definition		
WEEK2	簡介：催化劑的功能及其定義	Introduction: functions of catalyst and its definition		
WEEK3	2. 表面吸附現象	Surface adsorption phenomena		

WEEK4	2. 表面吸附現象	Surface adsorption phenomena
WEEK5	3. 催化反應動力學	Kinetics of catalytic reactions
WEEK6	3. 催化反應動力學	Kinetics of catalytic reactions
WEEK7	4. 催化材料的製備方法	The preparation methods of catalytic materials
WEEK8	4. 催化材料的製備方法	The preparation methods of catalytic materials
WEEK9	期中考	Mid-term examination
WEEK10	5. 催化材料的表徵技術	The characterization techniques of catalytic materials
WEEK11	5. 催化材料的表徵技術	The characterization techniques of catalytic materials
WEEK12	6. 催化材料在工業中的應用	Application of catalytic materials in industry.
WEEK13	7. 催化材料在環境中的應用	Application of catalytic materials in environments
WEEK14	8. 催化材料在能源科技中的應用	Application of catalytic materials in energy devices
WEEK15	8. 催化材料在能源科技中的應用	Application of catalytic materials in energy devices
WEEK16	9. 催化材料在電化學技術中的應用	Application of catalytic materials in electrochemical technologies
WEEK17	9. 催化材料在電化學技術中的應用	Application of catalytic materials in electrochemical technologies
WEEK18	期末考	Final examination

10. 中文成績評定(Chinese Evaluation method)

出席率60%、期中考20%、期末考20%

11. 英文成績評定(English Evaluation method)

Attendance 60%、mid-term examination 20%、final examination 20%

12. 中文課堂要求(Chinese Classroom requirements)

1. 上課專心，不要玩手機 2. 上課誤發出噪音音響他人上課 3. 上課出席率列入成績評量 4. 考試請準時到場

13. 英文課堂要求(English Classroom requirements)

1. Pay attention on the class not on the mobile phone 2. Don' t make noise in the classroom 3. Attendance will be the score of this course 4. Please attend ON TIME when taking examinations

14. 本課程與SDGs相關項目(This course is relevant to these of SDGs as following_)

4. 優質教育(Quality Education);

「遵守智慧財產權」；「不得非法影印」！