朝陽科技大學 099學年度第1學期教學大綱
Energy and Mass Balance 質能均衡

當期課號	1658	Course Number	1658
授課教師	賴龍山	Instructor	LAI,LONG SHAN
中文課名	質能均衡	Course Name	Energy and Mass Balance
開課單位	應用化學系(四日)二A	Department	
修習別	選修	Required/Elective	Elective
學分數	2	Credits	2
課程目標	本課程介紹在瞬間 (transient) 以及穩定 (steady) 情況下物質與能量的轉移、傳導，讓學生了解這些現象背後的動力機制，進而解決化工、生化系統中質能均衡的問題。	Objectives	Principles of heat and mass transfer. Steady and transient conduction and diffusion. Radiative heat transfer. Convective transport of heat and mass in both laminar and turbulent flows. Emphasis on the development of a physical understanding of the underlying phenomena and upon the ability to solve real heat and mass transfer problems of engineering significance.
教材	1. 原文教材如右 2. 自編講義	Teaching Materials	1. Basic Principles and Calculations in Chemical Engineering by Himmelblau & Riggs (7th edition), 2004 2. Notes
成績評量方式	1. 本課程規劃有四次考試(含期中考與期末考)，各占學期成績之 25%。 2. 本課程每週利用約 10 分鐘做小測驗(2-3%)，除歸納本週之上課重點，它也當作課堂參與之額外加分依據。	Grading	1. There would have four tests in this course, including the middle-term and final examinations. Thus, each test equally scores 25% of the course grading. 2. An additional score (2-3%) of a small quiz would be given for the curose involvement every week.
教師網頁			
教學內容	本課程，又名「化工原理與計算」，主要是銜接實驗室化學專業與工廠內化工製程之操作原理。 整體而言，本課程是以一位化工工程師的觀點來探討「化工廠內物質間之反應與其相關的質能變化」。吾人皆知，實驗室中化學反應是化學分子鍵結的合成與崩解，它們涉及質量、能量轉換、反應平衡等概念，這些經常應用在化學工廠的單元操作 (unit operation) 中；基本上，化工廠內的工作人員被要求對「參與化學反應的質量關係，以及反應中能量的去除或加入」必需相當清楚。以製藥業爲例，產業界目前所較欠缺的是擁有「製程化學(Process Chemistry)」的專業人才，這類人才擁有足夠的化學專業知識，也對化學工廠內製程之操作與質能均衡原理都非常瞭解，故可「以最經濟的化學反應成本來大量生產高附加物品，獲得最大的利益」。	Syllabus	This course is designed to connect the expertise of chemistry in laboratories and chemical engineering in industry. According to the points of view of chemical engineers, this course is to investigate chemical reactions and the associated changes of heat and mass in industry. As we all know, the chemical reaction is basically the linkage or dissolution of chemical bonds, in which the balance of energy/mass or the consept of equilibrium are usually discussed in unit operations of chemical industry. To run the chemical units smoothly, each person in the fild of chemicaloperatiions is asked to fully understand the input/output of materials or energy

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