

授課教師：Iman
Adipur

Instructor: Iman Adipurnama

課程名稱：質能均衡

Course Title : Material and Energy
Balances

2026/5/5

課程代號： TE2110301 Course Code 學分數： 3 Credits	必選修：必修/半學年 Required/Elective: Required/Half Yr. 先修課程： Prerequisites
節次教室： M6(TR-516) R3(TR-409-2) R4(TR-409-2) Time/Location	
專業核心能力： 運用數學、科學及化學知識的能力 Core Professional Competencies 發掘、分析及處理問題的能力	
課程網址： Course Website	
課程宗旨： The major course objectives are summarised below: Course Objectives <ol style="list-style-type: none"> 1. Introduce fundamental principles and calculation techniques used in chemical and process industries. ° 2. Apply material and energy balances to analyze chemical processes, including reactors and separation systems. ° 3. Develop problem-solving skills through structured exercises, conceptual analysis, and real-world case studies. ° 4. Gain experience in problem definition, data collection, and quantitative analysis. ° 5. Apply MEB principles to reactors, separation processes, and energy systems. ° 6. Enhance understanding through clear explanations and real-world examples to simplify complex concepts. ° 7. Foster lifelong problem-solving skills and critical thinking in chemical engineering applications. ° 8. Help students decide whether he or she has chosen the right field of study. ° 	
課程大綱： Part I. Engineering Problem Analysis: Outline of Lectures <ol style="list-style-type: none"> 1. Definitions of Chemical Engineering/What Some Chemical Engineering Do for a Living 2. Introduction to Engineering Calculations 3. Processes and Process Variables ° Part II. Material Balances: <ol style="list-style-type: none"> 1. Fundamentals of Material Balances 2. Single-Phase Systems 3. Multiphase Systems ° Part III. Energy Balances: <ol style="list-style-type: none"> 1. Energy and Energy Balances 2. Balance on Nonreactive Processes 3. Balance on Reactive Processes ° 	
授課方式： 講授 Lecture：50% Method of Instruction 分組討論 Group discussion：15% 案例研討 Case study：15%	

	<p>操做練習 Practical exercises : 20%</p> <p>講授 Lecture : %</p>
<p>教科書 : Textbooks</p>	<p>- Teaching Strategy:</p> <ol style="list-style-type: none"> 1. Constructive Alignment. 2. BOPPPS Model. <p>- Teaching Approaches/Methods:</p> <ol style="list-style-type: none"> 1. Active Learning. 2. CTask-Based Learning. 3. Collaborative Learning. 4. Context-Based Learning (Chemical Engineering Show & Tell). 5. Challenge-Based Learning (Optional).
<p>參考書目 : References</p>	<p>Elementary Principles of Chemical Processes, 3rd Edition, by Richard M. Felder and Ronald W. Rousseau, 2005 John Wiley and Sons Ltd (ISBN: 9780471375876, Tung Hua Book Co., Ltd)</p>
<p>修課須知 : Notice</p>	<ol style="list-style-type: none"> 1. Teaching Approaches: Active Learning, Problem-Based Learning, Task-Based Learning, Collaborative Learning, Context-Based Learning. ° 2. There is a TA for this course. ° 3. All materials on Moodle, Padlet, Line, or my Channel are protected by copyright and privacy laws. Do not share, copy, or use them without permission. ° 4. This course may be recorded and photographed, and data from student activities may be collected for documentation, editing, or potential public sharing.
<p>評量方式 : Grading</p>	<ol style="list-style-type: none"> 1. Quizzes and Homework: 25%. ° 2. Midterm Exam: 25%. ° 3. Final Exam: 30%. ° 4. Attendance, Attitude, Engagement (including interaction, Q&A, discussions, exercises, and explanations), Group & Individual Work, and Others: 20%
<p>備註說明 : Notes</p>	<p>1/Principles of Chemical Engineering Processes: Material and Energy Balances, 2e. ° 2/Basic Principles and Calculations in Chemical Engineering, 8e. ° 3/Perry's Chemical Engineers' Handbook, 9e. ° 4/Chemical, Biochemical, and Engineering Thermodynamics, 4e. ° 5/Separation Process Principles: Chemical and Biochemical Operations, 3e. ° 6/Chemical Process Analysis: Mass and Energy Balances. ° 7/Process Dynamics and Control, 3e. ° 8/AccessEngineering ° 9/Visual Encyclopedia of Chemical Engineering Equipment.</p>