



MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering



Principles of Chemical Engineering II
Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0404228	Principles of Chemical Engineering II	3	

INSTRUCTOR/COORDINATOR

Name	Eng.Bahia Maitah
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Website	

TEXTBOOK

Textbook: Felder, R.M., and R.W. Rousseau, "Elementary Principles of Chemical Engineering", Third Edition, John Wiley, 2005.

Other Supplemental Materials

Reference: *Basic Principles and Calculations in Chemical Engineering*, David Himmelblau, any edition.

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

Material balances on multiphase systems. Energy balance on closed system. Energy balance on open systems at steady state. Energy balances on non-reactive and reactive systems. Combined material and energy balances. Balances on transient systems.

B. Pre-requisites (P) or Co-requisites (C)

0404225

C. Course Type (Required or Elective)

Required (Compulsory department course)

SPECIFIC GOALS

A. Specific Outcomes of Instruction

By the end of the semester the student should be able to know:

1. Understanding the material balance on multi-phase systems. [SLO 1]
2. Understanding The first law of thermodynamics and associated topics. [SLO 1]
3. Understanding the energy balance of non-reactive and reactive systems. [SLO 1]
4. Understanding how to use thermodynamics tables. [SLO 1,6]
5. Understanding how to use psychrometric charts. [SLO 1,6]
6. Understanding heat of reactions, the heat of formation, and heat of combustion. [SLO 1]

B. Student Outcomes Addressed by the Course

1	2	3	4	5	6	7				
✓					✓					

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
<ul style="list-style-type: none"> • <i>Single-component phase equilibrium</i> • <i>The Gibbs phase rule</i> • <i>Gas-liquid systems: one condensable component</i> • <i>Multicomponent gas-liquid systems</i> • <i>Solutions of solids in liquids</i> • <i>Equilibrium between two liquid phases</i> • <i>Adsorption on solid surfaces</i> 	1,2,3,4	12 Hours
<ul style="list-style-type: none"> • <i>Forms of energy: the first law of thermodynamics</i> • <i>Kinetic and potential energy</i> • <i>Energy balances on closed systems</i> • <i>Energy balances on open systems at steady state</i> • <i>Tables of thermodynamics</i> • <i>Energy balance procedures</i> • <i>Mechanical energy balances</i> 	5,6,7	12 Hours
<ul style="list-style-type: none"> • <i>Elements of energy balance calculations</i> • <i>Changes in pressure at constant temperature</i> • <i>Changes in temperature</i> • <i>Phase change operations</i> • <i>Mixing and solutions</i> 	8,9,10,11	12 Hours
<ul style="list-style-type: none"> • <i>Heats of reactions</i> • <i>Hesse's law</i> • <i>Heats of formation</i> • <i>Fuels, combustions, and heat of combustion</i> 	12,13,14	12 Hours

• <i>Energy balance on reactive systems</i>		
Total	14weeks	12 Hours

METHODS OF ASSESSMENT			
No.	Method of assessment	Week and Date	%
1	First Exam	6th week	25
2	Second Exam	9th week	25
3	Final Exam	End of Semester	50
Total			100