MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering

Thermodynamics of Chemical Engineering (2)

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404344	Thermodynamics of Chemical Engineering (2)	3	3T

INSTRUCTOR/COORDINATOR

Name	Associate Prof. Dr. Emad El Qada
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TEXTBOOK

Title	Introduction to Chemical Engineering Thermodynamics
Author/Year	Smith, J.M., Van Ness, H.C., Abbott, M.M. and Swihart, M.T. / 2018

Other Supplemental Materials

Title	Thermodynamics: An Engineering Approach
Author/Year	Çengel Y.A. and Boles, M.A./ 2015
Electronic Materials	

SPECIFIC COURSE INFORMATION

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

Thermodynamics properties of pure compounds, introduction to Vapor-Liquid equilibria, theory of VLE of gas mixtures and liquid solutions, thermodynamics of solutions (models and applications).

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

P: Thermodynamics for Chemical Engineering (1) (0404343)

C. Course Type (Required or Elective)

Required

SPECIFIC GOALS

A. Specific Outcomes of Instruction

By the end of this course, the student should be able to:
CLO1- Apply fundamental property relations for systems of constant composition **(SLO 1)**.
CLO2- Derive equations that allow calculation of enthalpy and entropy values from PVT and heat-capacity data **{(SLO 1), (SLO 6)}**.
CLO3- Understand and apply residual and excess properties and partial molar properties to calculate thermodynamic properties **(SLO 1)**.
CLO4- Introduce the concept of two phase systems **(SLO 1)**.
CLO5- Apply the fundamental property relation to open phases of variable composition **{(SLO 1), (SLO 6)}**.
CLO6- Understand and use the chemical potential, fugacity and fugacity coefficient in solving phase equilibrium problems **(SLO 1)**.
CLO7- Define a standard mixing process and develop the property changes that accompany it **(SLO 1)**.
CLO8- Perform bubble point, dew point, and flash calculations using Raoult's law and modified versions **{(SLO 1), (SLO 6)}**.
CLO9- Introduce several excess Gibbs energy and activity coefficient models and the fitting of model parameters to experimental VLE data **{(SLO 1), (SLO 6)}**.

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
Introduction	2	6
The First Law and Other Basic Concepts	3	9
Volumetric Properties of Pure Fluids	3	9
Heat Effects	3	9
The Second Law of Thermodynamics	3	9
Total	*14*	*42*

METHODS OF ASSESSMENT

No.	Method of assessment	Week and Date	%
1	Mid-Term Examination	8	30
2	Homework	3, 6, 9	10
3	Quizzes	4, 7, 10	10
4	Final Examination	15, 16	50
	Total		100