



MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering



Principles of Chemical Engineering (1)

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404225	Principles of Chemical Engineering (1)	3	3T

INSTRUCTOR/COORDINATOR

Name	Associate Prof. Dr. Emad El Qada
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TEXTBOOK

Title	Elementary Principles of Chemical Processes
Author/Year	Felder, R.M., Rousseau, R.W. and Bullard, L.G./ 2016

Other Supplemental Materials

Title	Basic Principles and Calculations in Chemical Engineering
Author/Year	Himmelblau, D.M. and Riggs, J.B./ 2012
Electronic Materials	

SPECIFIC COURSE INFORMATION

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

Introducing the role of the chemical engineer in Industry and work ethics. Units and dimensions. Conversion of units. Systems of units. Dimensional homogeneity. Process data representation. Processes and process variables. Elementary mathematical tools for solving balance equations. Material balances for non-reactive and reactive systems. Material balances on single phase systems.

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

P: Engineering Chemistry (0303102) + Calculus 2 (0301102)

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-** Understand the role of chemical engineer (SLO 1).**CLO2-** Enhanced knowledge and skills needed for engineering calculations: Dimensions, units, systems of units, conversion factor, significant figures, linear interpolation, process data representation and analysis, fitting linear and nonlinear data {(SLO 1), (SLO 6)}.**CLO3-** Understand and explain the techniques used for the measurement of pressure, temperature, and flow (SLO 1).**CLO4-** Distinguish and explain the meaning of the following terms: batch, semibatch, continuous, transient and steady state processes, recycle and bypass streams (SLO 1).**CLO5-** Draw and fully label the flowchart, carry out the degree-of-freedom analysis, and perform the required calculations **Biweekly** (SLO 1).**CLO6-** Write and solve material balance (total, molecular and atomic balance) on non-reactive and reactive processes (single and multiple unit-processes) (SLO 1).**CLO7-** Define and calculate fractional excess, fractional conversion, yield, selectivity, limiting reactant, excess reactant, extent of reaction, theoretical and excess air (SLO 1).**CLO8-** Carry out PVT calculations for a gas using the equation of state (ideal gas law, the virial equation of state, the van der Waals equation and the SRK equation) (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
What Some Chemical Engineers Do for a Living	1	3
Introduction to Engineering Calculations	2	6
Processes and Process Variables	3	9
Fundamentals of Material Balances	5	15
Single-Phase Systems	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