MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering

Chemical Reaction Engineering 1

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404392	Chemical Reaction Engineering I	3	3/week

INSTRUCTOR/COORDINATOR	
Name	Dr. Nabeel Jarrah
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Website	

TEXTBOOK
H. Scott Fogler (2016) Elements of Chemical Reaction Engineering, 5th edition, Pearson Education
Other Supplemental Materials
Octave Levenspiel (1999) Chemical Reaction Engineering, 3rd edition, John Wiley & Sons.

SPECIFIC COURSE INFORMATION
A. Brief Description of the Content of the Course (Catalog Description)
Mole balances in a reactive system, rate laws and stoichiometry, isothermal ideal reactor designs (Batch, CSTR, PFR, PBR), Reactor design under pressure drop, collection and analysis of rate data, multiple reactions.
B. Pre-requisites (P) or Co-requisites (C)
0404343
C. Course Type (Required or Elective)
Required (Compulsory department course)

SPECIFIC GOALS

A. Specific Outcomes of Instruction

By the end of this course, the student should be able to:

1. Define the rate of chemical reaction [SO-1].
2. Apply the mole balance equations to a batch reactor, CSTR, PFR, and PBR [SO-1, SO-2].
3. Define conversion, space time and space velocity [SO-1].
4. Set up a stoichiometric table and write design equations as a function of conversion [SO-1, SO-2].
7. Design the different types of reactors including batch reactors, CSTRs, PFRs and PBRs under isothermal operation [SO-2].
8. Account for the effects of pressure drop on conversion in packed bed reactors [SO-1, SO-2].
9. Account for unsteady state operation in start-up of CSTRs and semibatch reactors [SO-1, SO-2].
9. Analyze experimental data and determine the reaction order and specific reaction rate [SO-6].
10. Analyze system with multiple reactions and decide which reactor should be used to the selectivity of the desired product [SO-1, SO-2].

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
Mole Balances	1	3
Conversion and Reactor Sizing	2	6
Rate Laws	1	3
Stoichiometry	2	6
Isothermal Reactor Design: Conversion	3	9
Isothermal Reactor Design: Moles And Molar Flow Rates	1	3
Collection And Analysis Of Rate Data	2	6
Multiple Reactions	2	6
Total	15	45

METHODS OF ASSESSMENT

No.	Method of assessment	Week and Date	%
1	First Exam	6th week	**20**
2	Second Exam	12th week	**20**
3	HW and Quizzes	Biweekly	**10**
3	Final Exam	16th week	**50**
Total			**100**