MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering

Chemical Reaction Engineering Lab

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404492	**Chemical Reaction Engineering Lab**	**1 credit hour**	**1 hour a week**

INSTRUCTOR/COORDINATOR

Name	Dr. Alanood Alsarayreh
Email	Alanood.sar@mutah.edu.jo
Website	

TEXTBOOK

1. **Chemical Reaction Engineering Lab Manual**
2. **Main text book :Elements of chemical reaction engineering by H. Scott Fogler**

Other Supplemental Materials

SPECIFIC COURSE INFORMATION

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

This laboratory aims to introduce students to the experimental methods of deducing rate law of a chemical reaction, conversion measurement in batch reactors, flow reactors (PFR and CSTR). RTD measurements in reactors.

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

0404491 Chemical Reaction Engineering (2)

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. **obtain the order of the chemical reaction by calculating the reaction rate constant K by using the experiment data.**
2. **Study the effect of varying process conditions on the reaction rate constant.**
3. **Apply analytical and numerical methods to determine reactor behavior and analyze the results**

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
1. **Review in chemical reaction engineering**	Week.1-2	
2. **Measurement of electrical conductivity for ionic solutions**	Week.3	
3. **Batch reactor part.1** - Find the reaction rate constant in a stirred batch reactor - Determination of reaction rate constant(k) for alkaline hydrolysis of ethyl acetate conductometrically	Week.4	
4. **Batch reactor part.2 (excess method)** - Estimate the value of reaction rate constant (K) by using the excess method of CH3COOC2H5.	Week.5	
5. **Batch reactor part.3** - Determine the value of K by the estimation of the activation energy E using Arrhenius equation with the presence of the effect of temperature.	Week.6	
6. **CSTR reactor (part.1)** - Estimate the value of the reaction rate constant using continues stirred tank reactor (K) and the conversion X.	Week.7	
7. **CSTR reactor (part.2)** - Calculate the average residence time. - Study the effect of a step input change on the dynamic behavior of continuous stirred tank reactors.	Week.8	
8. **Plug flow reactor** - Calculate the reaction rate constant K by using plug flow reactor.	Week.9	

Total

METHODS OF ASSESSMENT

No.	Method of assessment	Week and Date	%
1	Online Mid Examination	8th week	20
2	Reports and Lab. Participations	Report/week	30
3	Online final examination	End of Semester	50
	Total		100