MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering

Biochemical Engineering Course syllabus

Course Code	Course Name	Credits	Contact Hours
0404590	Biochemical Engineering	3	Office hours

INSTRUCTOR/COORDINATOR

Name	Rasha A. Hajarat
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Website	

TEXTBOOK

1- Biochemical engineering fundamentals by Bailey and Ollis.
2- Bioprocess engineering: basic concepts by Shuler and Kargi.

Other Supplemental Materials

1- Perry's chemical engineering handbook, by R. Perry, and D. Green.

SPECIFIC COURSE INFORMATION

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

1. Introduce modelling of biological activity in homogenous biological system by using kinetics and mass balance.
2. Extend kinetics-based reactor design for biological processes by consideration of physical aspects associated with bioreactor.

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

(P) Chemical engineering reaction (2) 0404491

C. Course Type (Required or Elective)

(E) Elective

SPECIFIC GOALS

A. Specific Outcomes of Instruction

1. Microbial activity, biological rate equations. (SOL 1, 2)
2. Cultivation of living cells in a batch culture. (SOL 1, 2)
3. Cultivation of living cells in a continuous culture. (SOL 1, 2)
4. Oxygen vs. carbon substrate limitation for living cells. (SOL 1, 2)
5. Cultivation of living cells in a variable volume culture. (SOL 1, 2)
6. Bioreactor design and configuration. (SOL 1, 2)
7. Rheology and mixing. (SOL 1, 2)
8. Use polymath program is solving problems. (SOL 1, 2, 6)

B. Student Outcomes Addressed by the Course

1	2	3	4	5	6	7				
x	x				x					

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Biological rate equations	1	3 hrs per week
Batch culture	1	3 hrs per week
Continuous culture	2	3 hrs per week
Oxygen vs. carbon substrate limitation	2	3 hrs per week
Variable volume culture	2	3 hrs per week
Bioreactor design and configuration	2	3 hrs per week
Rheology and mixing	2	3 hrs per week
Heat transfer	2	3 hrs per week
Application using polymath	2	3 hrs per week
Total	16	

METHODS OF ASSESSMENT

No.	Method of assessment	Week and Date	%
1	Mid exam	9th week	30
3	Project / assignments	Project	20
4	Final exam	End of Semester	50
	Total		100