MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering

Optimization of Chemical Processes

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404501	Optimization of Chemical Processes	3	48

INSTRUCTOR/COORDINATOR	
Name	**Dr. Salah ALJBOUR**
Email	saljbour@mutah.edu.jo
Website	

TEXTBOOK

TextBook:

- **T. F. Edgar, D. M. Himmelblau & L. S. Lasdon, 2001. Optimization of Chemical Processes, 2nd Ed.. McGrawHill, New York.**

References:

- **Ravindran, A., Ragsdell, K. M., Reklaitis, G. V., 2006. Engineering Optimization Methods and Applications, 2nd**
- **Ed., John Wiley & Sons, Inc., New Jersey.**
- **Taha, H. A., 2011, Operations Research: An Introduction, 9th Ed., Pearson, New York.**

SPECIFIC COURSE INFORMATION

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

Structure and formulation of optimization problems in chemical engineering. Optimality criteria, single and multivariable methods for unconstrained optimization. Linear programming. Optimality criteria and techniques for constrained optimization. Selected applications in chemical engineering.

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

(P): 0404404 Analysis and Modeling of Chemical Processes

C. Course Type (Required or Elective)

Selected Elective

SPECIFIC GOALS

A. Specific Outcomes of Instruction

Students who successfully complete the course will be able to:

1. **Underst the basic concepts of optimization (SLO-1)**
2. **Underst numerical methods for one dimensional objective function optimization (SLO-1)**
3. **solve applied linear and NL optimization problems from Chemical Engineering using optimization softwares (SLO-1)**
4. **Enhance students' skills through intensive use of available data resources and short projects with written and oral presentations (SLO-3)**

B. Student Learning Outcomes (SLOs) 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 to structure and process optimization	1	3 hr/week
• Introduction to the the basic optimization theory	2-4	3 hr/week
• Optimization Theory: Unconstrained one dimensional objective functions	5-7	3 hr/week
• Optimization Theory: Unconstrained multidimensional objective functions	8-9	3 hr/week
Mid Term Exam	1	
• Optimization Theory: Linear Programming (LP)	10-11	3 hr/week
• Programming (NLP) with constraints	12-13	3 hr/week
• Case Studies	14-15	3 hr/week
Final Exam	16	

METHODS OF ASSESSMENT

No.	Method of assessment	Week and Date	%
1	Midterm Examination	9th week	**30**
2	Homeworks and Activities	All over the Semester	**20**
3	Final examination	End of Semester	**50**
Total			**100**