MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering

MOMENTUM TRANSFER

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404330	**Momentum Transfer**	**2**	**To be determined later**

INSTRUCTOR/COORDINATOR	
Name	**Dr. Salah Aljbour**
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Website	

TEXTBOOK

Transport Phenomena, Revised 2nd Edition, John Wiley & Sons, Inc, 2006
by R. Byron Bird, Warren E. Stewart and Edwin N. Lightfoot

Other Supplemental Materials

- De Nevers, Noel. Fluid Mechanics for Chemical Engineers. 3rd ed. McGraw-Hill Chemical Engineering Series. Boston: McGraw-Hill Higher Education,
- Welty, Rorrer and Foster. Fundamentals of Momentum, Heat, and Mass Transfer, 6th ed. Danver, MA: Wiley, 2015. ISBN- 978-0-470-50481-9

SPECIFIC COURSE INFORMATION

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

This course aims to presents fluid-flow concepts through the derivation of the basic equations of continuity and momentum.

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

(P-1): 0404205 (Multivariate Mathematics)

(P-2): 0404224 (Fluid Mechanics)

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. apply knowledge of fundamental concepts in fluids (e.g. - density, pressure, viscosity) (**SLO 1and 2**)
2. analyze laminar, transitional, and turbulent fluid systems (**SLO 1and 2**)
3- conduct shell momentum balances in Cartesian and Cylindrical systems. (**SLO 1and 2**)
3- solve Newtonian and non-Newtonian fluid systems (**SLO 1and 2**)
4- identify appropriate initial and boundary conditions for solving microscopic and microscopic momentum transfer problems. (**SLO 1and 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
• **Introduction to Transport Phenomena** • **Introduction to Modeling** Transport Phenomena in Chemical Engineering, Microscopic and Macroscopic Sales in Engineering, Use and scope of mathematical modeling, Principles of model formulation, Model building, Modeling difficulties, Degree-of-freedom analysis, Selection of design variables.	1.5	3 hrs/week
• **Shell Balance Momentum Transfer** Velocity distribution in Cartesian , and spherical systems, Shear distribution, Average velocity in one, two and tree dimensional flows.	2.5	3 hrs/week
• **Equation of Momentum Change** Equation derivation. Velocity distribution using the equation of momentum change in several systems. Unsteady state momentum transfer.	2	3 hrs/week
• **Introduction to Boundary layer theory.** Concept of boundary layer and mathematical representation.	1	3 hrs/week
• **Introduction to Computational fluid Mechanics.** Discretization and numeral solution generation.	1	
Total	8	24 hrs

METHODS OF ASSESSMENT

No.	Method of assessment	Week and Date	%
1	Online Midterm Exam	4th week	**30**
2	Homeworks	Homework/week	**15**
3	Discipline, and Online Class Participation	Each Class	**5**
4	Final Exam	End of Semester	**50**
Total			**100**