



Jordan University of Science and Technology
Faculty of Engineering
Chemical Engineering Department
ChE 244: Fluid Mechanics for Chemical Engineers

3 credit hour, 3 contact hour lecture, 3 credit hour Eng.

Instructor

Instructor: Prof. Majdi Al-Mahasneh

E-mail: mmajdi@just.edu.jo

Textbooks & References

A. Textbook

	Textbook 1
Title	Fluid Mechanics for Chemical Engineers
Author(s)	Noel de Nevers
Publisher	McGraw-Hill Education
Year	2004
Edition	3rd

B. References

1. Cengel Y, Cimbala J. Fluid Mechanics Fundamentals and Applications. 3rd edition. McGraw-Hill Education; 2013.
2. Elger DF, Crowe CT, Roberson JA, Williams BC. Engineering Fluid Mechanics. 10th edition. Wiley; 2012.
3. White F. Fluid Mechanics, 8th edition. New Delhi, India: Mc Graw Hill India; 2016.
4. Bruce R. Munson, Donald F. Young, Theodore H. Okiishi and Wade W. Huebsch, A Brief Introduction To Fluid Mechanics 5th edition, John Wiley & Sons, 2010.
5. Philip J. Pritchard, John W. Mitchell, Fox and McDonald's Introduction to Fluid Mechanics 9th edition, John Wiley & Sons, 2015.

Specific Course Information

A. Course Catalog:

Properties of fluids, Fluid static, Continuity equation, Mechanical energy equation, Bernoulli's equation, Flow measuring devices, Fluid friction of flowing systems, Pumps types and their performance curves, Momentum balance

B. Prerequisites or co-requisites

ChE 203

C. Required/Elective or Selected Elective

Required

Objectives and Outcomes*

1. Knowledge of fluid types and physical quantities related to fluid mechanics [1]
2. Solve pressure related problems for static fluids [1]
3. Apply mass and energy balances on fluid flow systems [1]

* Number in brackets refer to the Program outcomes

4. Apply Bernoulli's equation for flow measuring devices to calculate the volumetric flow rate [1]
5. Apply mechanical energy balance equation for systems including friction and/or shaft work. [1,2]
6. Estimate pressure drop and friction loss in fluid flow systems. [1,2]
7. Get acquainted with pump and compressor types, their performance, uses and limitations. [2]

Contribution of Course to Meeting the Professional Component

Relationship to Student Outcomes (%)

1	2	3	4	5	6	7
70	20	5		5		

Topics Covered

Week	Content
1-2	Introduction and Overview
3-5	Fluid Statics
6	The Overall Mass Balance and Component Mass Balances
7	The Overall Energy Balance
8-9	The Extended Bernoulli Equation
10-12	Pressure Drop and Friction Loss in Pipes
13	Pumps and Compressors
14	Dimensional analysis and Momentum Balance
15	Project Presentation

Evaluation

	Weight
Assignments	10%
Project	10%
1st Exam	20%
2nd Exam	20%
Final exam	40%