

Instructor Information	
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Office Hours	

Course Information	
Course Name	Fluid Mechanics
Course Number	0905241
Prerequisites	Chemical Engineering Principles, 0905241
Credit Hours	3
Class Meeting	

Course Description	
Course Objectives	This course is an introduction to fluid mechanics, and emphasizes fundamental concepts and problem-solving techniques.
Text Books	1. Yunus A. Cengel, John M. Cimbala, Fluid Mechanics: Fundamentals and Applications, McGraw Hill Higher Education, 1 st edition SI unit, 2006
References	1. Clayton T. Crowe, Donald F. Elger, John A. Roberson, Engineering Fluid Mechanics, John Wiley & Sons, Inc. USA; 8 th edition, 2005 2. Munson, Young, Okiishi, Fundamentals of Fluid Mechanics, 5th Edition, John Wiley and Sons, 2006. 3. Robert L. Street, Gray Z. Watters, John K. Vennard, Elementary Fluid Mechanics, 7th edition, John Wiley & Sons, Inc. USA, 1996.

Course Assessment		
Participation, Assignments, projects and Quizzes	10.0%	
Short exam	10.0%	
Midterm	30.0%	
Final Exam	50.0%	

Course Contents		
Topic	Text book	Ref. 1
1. Introduction to fluid mechanics	Chapter 1	Chapter 1
2. Physical properties and type of fluids	Chapter 2	Chapter 2
3. Fluid Statics: Basic hydrostatic equation, Buoyancy and manometers	Chapter 3	Chapter 3 and Chapter 4
4. Bernouli's equation	Chapter 5	Chapter 4
5. Fluid flow measurements	Chapter 5	Chapter 13
6. Fluid friction in steady flow: internal and external flows	Chapter 8	Chapter 9, Chapter 10 and Chapter 11
7. Macroscopic momentum balances	Chapter 6	Chapter 6

8. Dimensional analysis	Chapter 7	Chapter 8
9. Open channel flow	Chapter 13	Chapter 15
10. Pumping of fluid and pump selection	Chapter 8	Chapter 14
11. Fluid mixing	Extra note	

Prerequisite

Student who attend this course **MUST** be familiar with

- ✓ Basic mathematics: Integration and differentiation
- ✓ Units and dimensions (Dimensional Homogeneity, SI and English unit) and unity conversion ratios.
- ✓ Basic physical definitions and concepts
- ✓ Estimation, calculation and investigation of the different physical and chemical properties such as viscosity, density, vapor pressure.... Etc.
- ✓ Mass and energy conservation laws (Material and Energy Balance)
- ✓ Equation of states (ideal gas law...etc)

Expected Course Outcomes

Upon completion of this course, students will be able to:

1. Determine pressures and forces on submerged bodies
2. Analyze flow rates, velocities, energy losses, and momentum fluxes for fluid systems
3. Describe fluid flow phenomena
4. Analyze, design, and evaluate pumping systems and pipeline components

Regulations

I. Attendance:

Attendance of classes is obligatory. Absence must be verified according to the university's regulation, ***please take it serious.***

II. Quizzes and homework

All students are required to finish their homework assignments, and submit them on time. Late homework ***will not be accepted*** under any circumstances. Pop-up quizzes will be given without any prior notice. You need to come prepared to class. A hand calculator is recommended to be available in every class. In addition to the final exam, there will be one midterm exam. These exams will be challenging and comprehensive during the class

IV. Conduct in classroom:

While in the class room, all cell phones, Laptops need to be turned off.