

Faculty of Engineering & Technology
Thermodynamics and Fluid Mechanics

Information :

Course Code : MPR 243 **Level :** Undergraduate **Course Hours :** 3.00- Hours

Department : Department of Electrical Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Anas Mohamed Abdelrahman Ali	2
Assistant Lecturer	Moustafa Raafat Aziz Shousha	3

Area Of Study :

- “Enrich students knowledge about the theory of fluid mechanics and the comparison between fluids and other substances.
- “Enrich students knowledge about the theory of thermodynamics and heat transfer systems on different thermodynamics systems.
- “Train students to measure different fluid properties and analyze different fluid systems in laboratory.

Description :

Thermodynamics: Macroscopic approach to energy analysis, Energy transfer as work and heat, The first law of thermodynamics, Properties and states of pure substances, Control-mass and control-volume analysis, The essence of entropy and the second law of thermodynamics, Fluid Mechanics: Fluid properties, Similarity of fluid flows, Fluid statics; Pressure, Fluid dynamics; Conservation equations of mass and mechanical energies (Bernoulli equation), Energy and momentum conservation equations and applications, Flow through pipes; Laminar and turbulent flows, Pipes connected in series and parallel, branching of pipes, Measuring devices.

Course outcomes :

a. Knowledge and Understanding: :

1 -	Illustrate between series and parallel pipe network design.
2 -	State the difference between different fluid flow types.
3 -	Define new terms; System, Thermodynamics, Fluid Mechanics.
4 -	Recognize the difference between fluids and other substances.
5 -	Relate the physics background to fluids.

b. Intellectual Skills: :

1 -	Deduce conservation equations of mass and energy
2 -	Analyze different system types found in nature.
3 -	Solve different engineering problems related to Thermodynamics and Fluid Mechanics.

c. Professional and Practical Skills: :

1 -	Write a technical report on a project or an assignment.
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2 -	Follow up safety requirements at experimental work and observe the appropriate steps to manage risks.
3 -	Practice basic experiments on Thermodynamics and Fluid Mechanics.
4 -	Calculate experimentally the performance of fluid and thermal devices.

d.General and Transferable Skills: :

1 -	Refer to relevant literatures
2 -	Effectively manage tasks, time, and resources.
3 -	Lead and motivate individuals.
4 -	Collaborate effectively within multidisciplinary team.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to fluid mechanics	4	3	1
Properties of fluids	6	3	3
Fluid statics	6	3	3
Fluid kinematics	4	3	1
Fluid dynamics	14	9	5
Internal flow	6	3	3
Momentum equation	5	3	2
Introduction to thermodynamics	6	3	3
Heat transfer methods	9	6	3
First law of thermodynamics	9	6	3
Second law of thermodynamics	6	3	3

Teaching And Learning Methodologies :

Interactive Lecturing
Discussion
Problem Solving
Experiential Learning
Cooperative Learning
Research activity

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	5.00		
Final Exam	40.00		
Lab Exper.	10.00		
Mid- Exam I	15.00		to assess the skills of problem solving, understanding of related topics
Mid- Exam II	15.00		

Oral Exam	10.00		
Quizzes	5.00		

Course Notes :

No course notes are required

Recommended books :

None