FUTURE UNIVERSITY IN EGYPT
جامعة المستقبل

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	Mohamed Mokhtar Saad Fahim Hefny	2
Lecturer	Mohamed Mokhtar Saad Fahim Hefny	2
Assistant Lecturer	Moustafa Raafat Aziz Shousha	3
Teaching Assistant	Mohamed Moharam Abdulaziz Elsayed Komiha	

Area Of Study :

ÅEnrich studentsôknowledge about the theory of fluid mechanics and the comparison between fluids and other substances.
ÅEnrich studentsôknowledge about the theory of thermodynamics and heat transfer systems on different thermodynamics systems.
ÅTrain studentsôto 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 -	Relate the physics background to fluids.
2 -	Recognize the difference between fluids and other substances.
3 -	Define new terms; System, Thermodynamics, Fluid Mechanics.
4 -	State the difference between different fluid flow types.
5 -	Illustrate between series and parallel pipe network design.
b.Intellectual Skills: :	
1 -	Solve different engineering problems related to Thermodynamics and Fluid Mechanics.
2 -	Analyze different system types found in nature.
3 -	Deduce conservation equations of mass and energy

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c.Professional and Practical Skills: :	
1 -	Calculate experimentally the performance of fluid and thermal devices.
2 -	Practice basic experiments on Thermodynamics and Fluid Mechanics.
3 -	Follow up safety requirements at experimental work and observe the appropriate steps to manage risks.
4 -	Write a technical report on a project or an assignment.
d.General and Transferable Skills: :	
1 -	Collaborate effectively within multidisciplinary team.
2 -	Lead and motivate individuals.
3 -	Effectively manage tasks, time, and resources.
4 -	Refer to relevant literatures

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		

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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

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