Faculty of Engineering & Technology

Engineering Thermodynamics

Information :

Course Code :	MPR 251	**Level**	: Undergraduate	**Course Hours :**	4.00- Hours

Department :	Department of Mechanical Engineering

Instructor Information :

Title	Name	Office hours
Professor	Mahmoud Abdelrasheed Nosier Touny	8
Lecturer	Anas Mohamed Abdelrahman Ali	6
Assistant Lecturer	Moustafa Raafat Aziz Shousha	3
Assistant Lecturer	Moustafa Raafat Aziz Shousha	3

Area Of Study :

Understand fundamentals of thermodynamics
˝Apply the fundamental principles of thermodynamics
˝Explore the fundamental principles of thermo dynamics through experimentation
˝Develop skills for analyzing experimental data and working in teams
˝Share ideas and work in a team.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Identify basic applied and engineering science.
2 -	Identify principles in the of design of mechanical components, different materials, and manufacturing technologies in the field of mechanical power engineering and some other engineering disciplines.
3 -	Identify principles in the field of design of fluid flow, thermodynamics, gas dynamics, turbo- machinery, heat transfer engineering and fundamentals of thermal and fluid processes
4 -	Develop conceptual and detailed design of construction projects and fluid power systems.

b.Intellectual Skills: :

1 -	Define the mechanical power engineering problems and evaluate designs, processes, and performance and propose improvements.
2 -	Derive different solution alternatives for the engineering problems, analyze, interpret data and design experiments to obtain new data, and evaluate the power losses in the fluid transmission lines and networks
3 -	Analyze the performance of the basic types of internal combustion engines, hydraulic machines, fluid power systems, subsystems and various control valves and actuators. Analyze the solution alternatives and choose the optimum one.

c.Professional and Practical Skills: :

1 -	Use laboratory, workshop e4quipment and field devices competently and safely.
2 -	Analyze the record data in the laboratory.

3 -	Prepare engineering drawings, computer graphics, and write specialized technical reports.	
4 -	Write computer programs pertaining to mechanical power and energy engineering to describe the basic thermal and fluid processes mathematically, and use the computer software for their simulation and analysis.	

d.General and Transferable Skills: :

1 -	Collaborate effectively within multidisciplinary team.
2 -	Share ideas, communicate effectively and work in stressful environment and within constraints.
3 -	Lead and motivate individuals and work with others according to the rules of the professional Ethics.
4 -	Use digital libraries and/or Learning systems and demonstrate efficient IT capabilities.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Basic concepts and definitions, system and control volume	6	3	3
Property and state, processes and cycles	6	3	3
Definition of work and heat transfer	12	6	6
Ideal gases; state equation; specific heat at constant pressure and volume	6	3	3
Pure substances and phase equilibrium	6	3	3
Tables of thermodynamic properties	6	3	3
First law of thermodynamics; internal energy and enthalpy	6	3	3
First law for closed and open systems	6	3	3
Steady flow and uniform state uniform flow	12	6	6
Application of first law of thermodynamics	12	6	6
Second law of thermodynamics	12	6	6

Teaching And Learning Methodologies :

Lectures
Tutorials
Presentation & Discussion
Brain storming

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Attendance	5.00	1	
Final examination	40.00	16	
Homework assignments	15.00	11	
Mid-term examination	30.00	6	
Quizzes	10.00	4	

http://www.fue.edu.eg
Ô[ ] ˆ¦ã @â¦ ¦G€FHﬔZ˘ č˙¦^Á﬚¸ã¸^¦•ã¸Á¸ÁÒˆˆ] câ¶Cﬂ¦Áã @•Á•^¦ç^åÈ

Recommended books :

1) Fundamentals of Thermodynamics, Richard E. Sonntag, Claus Borgnakke, and   Gordon J. Van Wylen , John Wiley &Sons, Inc., 2003

2) Applied Thermodynamics for Engineering Technologists,
   T.D. Eastop and A.McConkey, Longman Group, Ltd. 1998