

The Hashemite University Faculty of Engineering Course Syllabus Department of Mechanical Engineering

Course title: Thermodynamics-I 3 (3,0,0) Course Number: 110402221

Designation: Compulsory **Prerequisite(s):** 110102101 & 110103107

Instructor: Dr. Ahmad ALMIGDADY Instructor's e-mail: ahmad.alqan@gmail.com

Office Hours:

Course Description (catalog): Students will be introduced to the Properties and behavior of a pure substance. First law and second law analysis applied to different systems and control volumes

Textbook(s) and/or Other Supplementary Materials:

Yunus A. Cengel, and Michael A. Boles, "Thermodynamics, an Engineering Approach," 8th edition McGraw-Hill

References: *************

Major Topics Covered:

Topics	No. of Weeks	Contact hours*
Ch.1: Basic Concepts of Thermodynamics.	2	6
Ch.2: Energy, Energy Transfer, And General Energy Analysis.	1	6
Ch.3: Properties of Pure Substances.	3	6
Ch.4: Energy Transfer by Heat, Work, and Mass.	2	3
Ch.5: Energy Analysis of open Systems: control volumes.	2	6
Ch.6: The Second Law of Thermodynamics.	2	6
Ch.7: Entropy.	2	6
Total	15	45

^{*}Contact hours include lectures, quizzes and exams

Specific Outcomes of Instruction (Course Learning Outcomes):

After completing the course, the student will be able to:

- 1) Identify the properties and the state of a pure substance using thermodynamic tables and locate the substance state on the phase diagram. These properties include: pressure, temperature, specific volume, internal energy, enthalpy, entropy, etc. (a,e)
- 2) Studying the behavior of ideal gases and use thermodynamic tables to determine their properties. (a,e).
- 3) Applying the first law of thermodynamics of thermodynamic to a closed system (a,e).
- 4) Application of first law of thermodynamic to a n open system "control volumes and control surfaces" (a.e)
- 5) Demonstrate the second law of thermodynamics and the concept of entropy (a,e)

^{**} soft copy of the book is available on moodle course page

Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution			
General Engineering Student Outcomes					
(a)	an ability to apply knowledge of mathematics, science, and engineering	Н			
(b)	an ability to design and conduct experiments, as well as to analyze and interpret				
	data				
(c)	an ability to design a system, component, or process to meet desired needs within				
	realistic constraints such as economic, environmental, social, political, ethical,				
	health and safety, manufacturability, and sustainability				
(d)	an ability to function on multidisciplinary teams				
(e)	an ability to identify, formulate, and solve engineering problems	Н			
(f)	an understanding of professional and ethical responsibility				
(g)	an ability to communicate effectively				
(h)	the broad education necessary to understand the impact of engineering solutions				
	in a global, economic, environmental, and societal context				
(i)	a recognition of the need for, and an ability to engage in life-long learning				
(j)	a knowledge of contemporary issues				
(k)	an ability to use the techniques, skills, and modern engineering tools necessary				
	for engineering practice.				
	H=High, M= Medium, L=Low				

Grading Plan:

First Exam	(15 Points)	Will be announced later
Second Exam	(15 Points)	Will be announced later
Quizzes &	(20 Points)	4 quizzes will be conducted
Homework's	(20 Points)	through moodle platform
Final Exam	(50 points)	

General Notes:

The home work assignment will include analyzing an integrated thermodynamic system that may contain various components like turbine, compressor, pump, expansion valve, heat exchangers, boiler, mixing chambers and/or piston-cylinder assembly

Prepared by: Dr. Ahmad ALM IGDADY Date: 18th Sep. 2016