The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Thermodynamics Lab	0934345	

2019 Course Catalog Description

Experimental methods in the following : Mechanical equivalent of heat, The adiabatic exponent, Marcet boiler, Bomb calorimeter, Flow through nozzle, Refrigeration system, Air conditioning system, Heat pump and air cooler, single stage air compressor, cooling tower, Thermic unit (steam turbine power plant).

Instructors

Name	E-mail	Sec	Office Hours		Lecture Time	

Text Books

	Text book 1	Text book 2
Title	Lab Manual.	Thermodynamics: an engineering approach
Author(s)		Y. Cengel and M. Boles
Publisher, Year, Edition	The University of Jordan	McGraw Hill, 2014, 8th Edition

References

Books	Any of the references recommended for Thermodynamics (2) course
Journals	Same as that given in Thermodynamics (2) course outline
Internet links	Same as that given in Thermodynamics (2) course outline

Prerequisites

Prerequisites by topic	Power cycles, refrigeration cycles, steam tables, gas laws, first law of thermodynamics, report writing.
Prerequisites by course	Thermodynamics (2) - 0904342
Co-requisites by course	-
Prerequisite for	

Topics Covered

Week	Topics	Chapter in Text	Sections
1	How to write report	Chapter (3): Measurements Chapter (15): Measurements	16 + 17
2	Mechanical equivalent of heat;	Chapter (4): Thermodynamics	2
3	The adiabatic exponent; (if working)	Chapter (7): Thermodynamics	9
4	Marcet boiler;	Chapter (12): Thermodynamics	3
5	Flow through nozzle;	Chapter (17): Thermodynamics	3
6	Refrigeration system; *	Chapter (11): Thermodynamics	3 + 4
7	Air-cooler and heat pump; *	Chapter (11): Thermodynamics	7
8	Heat pump and air cooler;	Chapter (13): Thermodynamics	7
9	Single stage air compressor; *		
10	Thermic unit (steam turbine power plant).*	Chapter (10): Thermodynamics	2 + 3

Mapping of Course Outcomes to ABET Student Outcomes

SOs	Course Outcomes
6	1. Perform various thermodynamic calculations for different systems like specific heat ratio for air, cycles' efficiencies, COP, power, mechanical equivalent of heat and verify certain thermodynamic relations. 2. Design an experiment to measure the specific heat of air or measure torque of compressor or find relation between heat and work.
5	3. Write Group technical report and conduct oral presentation on any of the major experiments.

Evaluation

Assessment Tools	Expected Due Date	Weight
Quizzes		10%
Midterm Exam		30%
Report		20%
Final Exam		40%

Contribution of Course to Meet the Professional Components

The student gains the ability to understand and analyze a wide variety of thermodynamic systems.

Relationship to Student Outcomes

SOs	1	2	3	4	5	6	7
Availability					X	X	

Relationship to Mechanical Engineering Program Objectives (MEPOs)

MEPO1	MEPO2	MEPO3	MEPO4	MEPO5

ABET Student Outcomes (SOs)

1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	An ability to communicate effectively with a range of audiences
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Updated by ABET Committee, 2021