Jordan University of Science and Technology

Faculty of Engineering

Aeronautical Engineering Department

AE321 Thermodynamics - JNQF Level: 7
First Semester 2023-2024

Course Catalog
3 Credit Hours. This course aims to offer students a fundamental understanding of applied thermodynamic concepts. Topics covered include the properties and behavior of a pure substance, the study of the first and second laws of thermodynamics, an introduction to exergy, and cycles pertinent to the aeronautics industry.

Text Book	
Title	Thermodynamics An Engineering Approach
Author(s)	Yunus A. Cengel, Michael A. Boles
Edition	9th Edition
Short Name	1
Other Information	

Instructor	
Name	**Dr. Montasir Hader**
Office Location	N1L2
Office Hours	Sun : 09:30 - 10:30 Sun : 11:30 - 12:30 Mon : 13:30 - 14:30 Tue : 09:30 - 10:30 Tue : 11:30 - 12:30 Thu : 09:30 - 10:30
Email	hader@just.edu.jo

Class Schedule & Room

Section 1:
Lecture Time: Sun, Tue, Thu : 08:30 - 09:30
Room: CH2107

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
921010	PHY101 General Physics (1)	Prerequisite / Pass
902030	MATH203 Ordinary Differential Equations	Prerequisite / Pass
911020	CHEM102 General Chemistry (2)	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Basic concepts of thermodynamics	**chapter 1, chapter 2** From **1**
Weeks 2, 3	Properties of pure substances	**Chapter 3** From **1**
Weeks 4, 5	Energy transfer by heat , work, and mass	**Chapter 4** From **1**
Weeks 6, 7, 8	The first law of thermodynamics	**Chapter 5** From **1**
Weeks 9, 10, 11	The second law of thermodynamics	**Chapter 6** From **1**
Weeks 12, 13, 14	Entropy	**Chapter 7** From **1**
Weeks 15, 16	Applications	**handouts** From **1**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Recognize the scope and domain of thermodynamics, as well as where it can be used. [1SO1] [1L7K1]	10%	
Identify the proper vocabulary used to define the fundamental concepts of thermodynamics. [1SO1] [1L7K1]	15%	
Apply ideal gas equation of state and property diagrams and the use of tables to find properties of pure substances and ideal gases. [1SO1] [1L7K1]	15%	
Apply concepts of energy conservation to solve energy balance problems in closed systems. [1SO1] [1L7K1]	15%	
Apply the first law of thermodynamics to solve energy balance problems for commonly encountered steady-flow devices. [1SO1] [1L7K1]	15%	
Apply the second law of thermodynamics to solve thermal cycles with emphasis on reversible and irreversible processes, heat engines, refrigerators and heat pumps [1SO1] [1L7K1]	15%	

Identify the thermodynamics of common processes in aeronautical engineering [1SO2] [1L7S1]	15%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
85	15					

Relationship to NQF Outcomes (Out of 100%)	
L7K1	L7S1
85	15

Evaluation	
Assessment Tool	**Weight**
First Exam	30%
Second Exam	30%
Final	40%

Policy	
Attendance Policy	Every student is expected to attend all scheduled class sessions, including first, second and final exams. There are no excused absences

Date Printed: 2023-12-06