

T-104 2022

Course Specification

Course Title:	Thermodynamics Laboratory	
Course Code: Phys 391		
Program:	B.Sc. in Physics	
Department:	Department of Physics and astronomy	
College:	College of Science	
Institution:	King Saud University	
Version: 2.0.0		
Last Revision Date: Sep 2023		





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A. General information about the course:						
Со	ourse Identificati	on				
1.	Credit hours:	2(0+0+4)				
2.	Course type					
a.	University 🗆	College 🗆	Dej	partment⊠	Track□	Others
b.	Required 🖂	Elective				
3. Level/year at which this course is 6 th level offered:						
4. Course general Description Specific Heat – Joule's Law (The mechanical equivalent of heat) – Boyle's Law – Viscosity - Thermal Expansion of Liquids - Linear Thermal Expansion of Solids - Vapour Pressure of Water - Heat Conduction of Metals						
5. Pre-requirements for this course (if any): Thermodynamics (PHYS 241)						
6. Co- requirements for this course (if any):						
 7. Course Main Objective(s) 1. The student should be able to acquire a good background about heat and temperature and their basic laws. 						

- 2. The student should have experience on the concept of heat transfer between different bodies.
- 3. The student should have enough experience on the laws of thermodynamics and their applications.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	32	100%
2.	E-learning	0	0
3.	HybridTraditional classroomE-learning	0	0
4.	Distance learning	0	0

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	0
2.	Laboratory/Studio	32
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
	Total	32





Methou	3			
Code	Course Learning	Code of CLOs aligned	Teaching	Assessment
	Outcomes	with program	Strategies	Methods
1.0	Knowledge and unde	rstanding		
1.1	Recognize the difference between Specific Heat, Heat Transfer and their basic laws.	K1	Discussions Brainstorming	Prelab questions
1.2	Recognize knowledge about some phenomena associated with temperature variations and some applications of thermodynamics laws.	K2	Small group work	Exam
1.3	Ability to distinguish between the concept of Heat capacity and Specific heat capacity.	КЗ	Brainstorming	Prelab questions & Report
2.0		Skills		
2.1	Summarize some interesting experiments and applications in the field of the studied course.	S1	Examples	Prelab questions
2.2	Explain the daily life applications of the studied topics.	S2		Prelab questions
2.3	Improve the skill of using Excel.	S3		Writing report
3.0		Values, autonomy, and	responsibility	
3.1	Illustrate how to Communicate and work with others.	V1		Group report
3.2	Identify how to write a practical report.	V2	Group work	Report
3.3	Students can analyze answers and	V3		Analytical report

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods





Code	Course Learning	Code of CLOs aligned	Teaching	Assessment
	Outcomes	with program	Strategies	Methods
	solutions to fix their errors.			

C. Course Content

No	List of Topics	Contact Hours
1.	Specific Heat	4
2.	Joule's Law (The mechanical equivalent of heat)	4
3.	Boyle's Law	4
4.	Viscosity	4
5.	Thermal Expansion of Liquids	4
6.	Thermal Expansion of Solids	4
7	Vapour Pressure of Water	4
8.	Heat Conduction of Metals	4
	Total	32

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Experimental reports	Weekly	40%
2.	Theoretical reports	Weekly	20%
3.	Final theoretical exam	Approx. 12 th	10%
4.	Final practical exam	Approx. 13 th	30%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

	1. Physics for Scientists and Engineers 9th Edition, R. Serway and
	J. Jewett, Cengage learning USA, (2016).
Essential References	2. Heat and Thermodynamics (8 th edition), W. Zemansky,
	Mc Graw Hill India; 8 th edition (2011).
	3. Special notebooks for thermodynamics experiments.
Supportive References	
Electronic Materials	Websites on the internet that are relevant to the course topics.
Other Learning Materials	





2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Laboratory room capacity of 25 students.
Technology equipment (projector, smart board, software)	Whiteboard and Smart board
Other equipment (depending on the nature of the specialty)	N/A

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students\ Peer Reviewer	Indirect \ direct
Effectiveness of students assessment	Students- Faculty	Direct
Quality of learning resources	students	Indirect
The extent to which CLOs have been achieved	Faculty	Indirect
Other	None	None

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify) Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Physics Department's council
REFERENCE NO.	6 th (1 st term/1446)
DATE	22/05/1446

