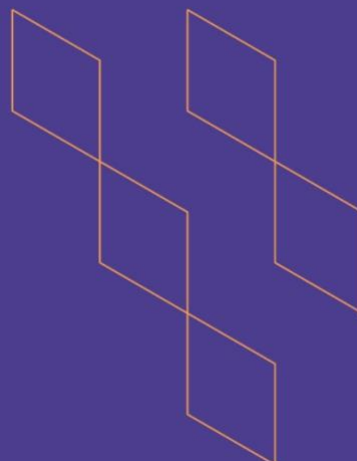




T-104
2022

Course Specification



Course Title:	General physics I
Course Code:	PHYS 110
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:	Oct 2023



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A. General information about the course:

Course Identification

1. Credit hours: 4(3+0+2)

2. Course type

a. University ☐ College ☐ Department ☒ Track ☐ Others ☐

b. Required ☒ Elective ☐

3. Level/year at which this course is offered: third level / second year.

4. Course general Description

The course aims to introduce students to the basic general physics, especially mechanics and thermodynamics. The main topics are Units and dimensions, Motion in One Dimension, Introduction to vectors, The Laws of Motion (without friction), Energy of a System, Conservation of Energy, Elastic Properties of Solids, basic fluid Mechanics, introduction to Temperature, The zeroth and First Law of Thermodynamics, Thermal Expansion of Solids and Liquids

5. Pre-requirements for this course (if any): Math 101

6. Co- requirements for this course (if any): Phys 111

7. Course Main Objective(s)

1. Units and measurements and their conversions.
2. Simple vectors analysis.
3. Description of motion in one dimension.
4. The study of Newton's laws and concept of force.
5. The meaning of mechanical energy in physics: its concept and main types, energy conversion, and work-kinetic energy theorem
6. Basic Elastic Properties of Solids
7. Introduction to fluid mechanics: its dynamics and applications.
8. The concept of temperature, energy transfer mechanisms in Thermal Processes and Thermal Expansion of Solids and Liquids.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	75	100%
2.	E-learning	0	0
3.	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 	0	0
4.	Distance learning	0	0

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	30
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
	Total	75

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe Newton's Laws and the concept of work and energy.	K1	<ul style="list-style-type: none">Give extensive examples during lecture.Give problem sheets to be discussed during lecture..	<ul style="list-style-type: none">Hold Class discussion, tutorial sessions.Give quizzes, mid-term exam and final exam.
1.2	Define concepts in fluid mechanics and heat	K2		
2.0	Skills			
2.1	Apply Newton's Laws and the conservation of energy to solve problems	S1	<ul style="list-style-type: none">Give extensive examples during lectureGive problem sheets to be discussed during lecture and labs.assignments.Discussions in the classes	<ul style="list-style-type: none">Hold Class discussion, tutorial and lab sessions.Give quizzes, mid-term exam and final exam.
2.2	Reconstruct mathematical equations to be used in different situations	S2		
2.3	perform experiments related to Newton's Laws and fluid mechanics and temperature	S3		
3.0	Values, autonomy, and responsibility			



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Write scientific reports on different experiments	V1	<ul style="list-style-type: none"> • assignments. • Homework • Preform experiments 	Hold Class discussion

C. Course Content

No	List of Topics	Contact Hours
1.	Physics and Measurement: Standards of Length, Mass, and Time, Dimensional Analysis, Conversion of Units, Estimates and Order-of-Magnitude Calculations, Significant Figures	2
2.	Vectors: Coordinate Systems, Vector and Scalar Quantities, Some Properties of Vectors. Components of a Vector and Unit Vectors	3
3.	Motion in One Dimension: Position, Velocity, and Speed, Instantaneous Velocity and Speed, Analysis Model: Particle Under Constant Velocity, Acceleration, Analysis Model: Particle Under Constant Acceleration, Freely Falling Objects.	6
4.	The Laws of Motion: The Concept of Force, Newton's First Law and Inertial Frames, Mass, Newton's Second Law, The Gravitational Force and Weight, Newton's Third Law, Analysis Models Using Newton's Second Law.	8
5.	Energy of a System: Systems and Environments, Work Done by a Constant Force, The Scalar Product of Two Vectors, Work Done by a Varying Force, Kinetic Energy and the Work–Kinetic Energy Theorem, Potential Energy of a System, Conservative and Nonconservative Forces, Relationship Between Conservative Forces and Potential Energy.	6
6.	Conservation of Energy: Analysis Model: Nonisolated System (Energy), Analysis Model: Isolated System (Energy), Situations Involving Kinetic Friction, Changes in Mechanical Energy for Nonconservative Forces, Power	8
7.	Static Equilibrium and Elasticity: Elastic Properties of Solids	1
8.	Fluid Mechanics: Pressure, Variation of Pressure with Depth, Fluid Dynamics, Bernoulli's Equation, Other Applications of Fluid Dynamics	4
9.	Temperature: Temperature and the Zeroth Law of Thermodynamics, Thermometers and the Celsius Temperature Scale, The Constant-Volume Gas Thermometer and the Absolute Temperature Scale, Thermal Expansion of Solids and Liquids	4
10.	The First Law of Thermodynamics: Heat and Internal Energy, Specific Heat and Calorimetry, Energy Transfer Mechanisms in Thermal Processes	3
Total		

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First Midterm examination	Approx. 6	15%
2.	Second Midterm examination	Approx. 12	15%
3.	Labs	Weekly	30%
4.	Final examination	From 16 to 18	40%

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

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Physics for Scientists and Engineers, by R. A. Serway and J. W. Jewett, 9th Ed., Publisher: Cengage Learning
Supportive References	خضر الشيباني وأسامة العاني، "الفيزياء العامة للجامعات"، الطبعة الثانية. دار الخريجي
Electronic Materials	None
Other Learning Materials	Internet sites relevant to the course

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A classroom which accommodates 25 students or more.
Technology equipment (projector, smart board, software)	ePodium Facilities
Other equipment (depending on the nature of the specialty)	Not applicable

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

Assessment Areas/Issues	Assessor	Assessment Methods
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.	4 th (1 st term/1445)
DATE	11/10/2023

