T-104

Course Specification

Course Title:	physics - I
Course Code:	PHYS 1414-4
Program:	Bachelor for Engineering
Department:	Physics
College:	Science
Institution:	King khalid University
Version:	2
Last Revision Date:	26 Mars 2023

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	6(5+1)				
2. Course type					
a.	University ☐	College ☒	Department☐	Track☐	Others☐
b.	Required☒	Elective☐			
3. Level/year at which this course is offered: L3/Y1					
4. Course general Description					

- Physics and measurements
- Vectors
- Motion in one dimension
- Laws of Motion and Friction
- Work, Energy and Power
- Elastic Properties of Matter
- Fluid
- Thermal Physics
- Electric Current

5. Pre-requirements for this course (if any):
None

6. Co- requirements for this course (if any):
None

7. Course Main Objective(s)

The purpose of this course is to introduce the fundamentals of physics to the students. After completion of this course, students will have the knowledge of following :

-Principles of physical measurements, conversion of units, dimensional analysis.

- All algebraic processes related to vector quantities.

- Calculation of different parameters dealing with motion in one dimension (average speed, velocity, instantaneous velocity, instantaneous acceleration, free falling objects)

- Newton`s laws of motion, friction force and different applications.

- Work, kinetic energy, work-energy theory and conservative forces. potential energy.

- Buoyant forces, Archimedes principle, pressure of fluids, equation of continuity and Bernoulli's equation.

- Elastic properties of materials.

- Temperature and heat (Specific and Latent)

- Coulomb's law, electric field for point charge and electrical potential.

- Electric conductivity, electric current and electric energy.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
	Traditional classroom	6 h/ week	100 %
	E-learning	0	0 %
	Hybrid • Traditional classroom • E-learning	0	0 %
	Distance learning	0	0 %

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1	Lectures	48
2	Laboratory/Studio	24
3	Field	0
4	Tutorial	0
5	Others (specify)	0
	Total	**72**

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	To define vector, displacement, speed, velocity, force, work, energy,power, pressure,stress, strain, specific heat	K1	Lecture	• Quizzes • assignments • Examinations
1.2	To define stress, strain,young modulus of elasticity, flow rate, Bernoulli theorem, electric field, Ohms law and resistance	K2	Lecture	• Quizzes • assignments • Examinations
...				
2.0	Skills			
2.1	To differentiate between vectors and scalars, differentiate between speed and velocity, concept of work energy principle.	S1	Lecture	• Quizzes • assignments • Examinations
2.2	To understand the concept of equation of continuity, Bernoulli theorem To differentiate between electric field and electric potential.	S2	Lecture	• Quizzes • assignments • Examinations
2.3	To apply laws of physics studied in this course to daily life situation.	S3	Lecture	Practical
2.4	To apply the concept of electric charge and electric field, laws of resistance from Engineering Physics points of view.	S4	Lecture	Practical
3.0	Values, autonomy, and responsibility			
3.1	Numerical problems based on mechanics (vectors, force, work energy, power)	C1	Lecture	• Quizzes • assignments • Examinations
3.2	Numerical problems based on equation of continuity, Bernoulli equation, Young's Modulus of elasticity, Coulumb's law, Ohm's law	C2	Lecture	• Quizzes • assignments • Examinations
...				

C. Course Content

No	List of Topics	Contact Hours
13.	**Measurements, units and vectors.** Standards of Length, Mass and Time, Density, Dimensional Analysis, Conversion of Units, Significant figures Vectors and Scalars, Properties of Vectors, Addition of vectors, Components of a vector and unit vectors, Product of two vectors.	١٠
14.	**Motion in one dimension** Introduction to position, distance, displacement, average speed and velocity. Instantaneous speed, Average and instantaneous acceleration, uniformly accelerated motion, freely falling motion	١٠
3	**Newton's Laws of Motion and Friction** Concept of Force, Newton's Laws of Motion, Gravitational force and weight, Objects in equilibrium, Force of friction.	**10**
4	**Work, Kinetic Energy and Potential Energy** Work done by a constant force and a varying force, Kinetic energy and Work energy theorem, Conservation of energy, Power, Potential Energy, Conservative and Non- conservative forces	**5**
5	**Fluid Mechanics Pressure**, Variation of pressure with depth, Buoyant forces and Archimedes principle, Fluid dynamics, Equation of continuity, Bernoulli's Equation	**5**
6	**Elasticity** Elastic properties of Solids, Stress, Strain and Young's modulus of elasticity, Bulk and Shear modulus of elasticity	**5**
7	**Heat**, Temperature, Specific Heat, Latent Heat Temperature, Thermometers, Temperature Scale, Thermal Expansion of Solids, Heat and Internal Energy, Specific Heat and Principle of Calorimetry, Latent Heat	**5**
8	**Electric Field and Potential** Properties of electric charge, Charging objects by induction, Coulomb's Law, Electric field. Potential Difference and electric potential, Electric potential	**5**
9	**Currents and Resistance and Electric Energy and Power** Electric Current, Resistance, Ohm's Law, Electric Power, Resistors in Series and Parallel	**5**
Total		

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1	Mid exam	6	15 %
2	Assignment	4 & 8	10 %
3	Quiz	5	5 %
4	Practical	12	30 %
5	Final exam	13	40 %
6	total		100 %

* 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 Raymond A. Serway and John W. Jewett. ISBN 0534408427 Thomson Brooks/Cole © 2004; 6th Edition
Supportive References	Physics, Volume 1, Robert Resnick, David Halliday, Kenneth S. Krane
Electronic Materials	www.lms.kku.edu.sa to access lecture notes, text book, lab manual, announcements related to the course etc
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A classroom accommodated with 30 seats and equipped with Internet access.
Technology equipment (projector, smart board, software)	2 demonstration rooms and each one accommodated with 15 seats and equipped with Internet access and 15 personal computers.
Other equipment (depending on the nature of the specialty)	Providing educational facilities and models in the lecture

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Indirect
Effectiveness of students assessment	Academic Development and Quality Committee Peer Reviewer	Indirect Indirect
Quality of learning resources	Student Program Leader	Indirect Indirect
The extent to which CLOs have been achieved	Faculty	Direct
Other		

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

G. Specification Approval Data

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	