هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAAA

2024
TP-153

Course Specification
(Bachelor)

Course Title:	**physics-I**
Course Code:	**1414 Phys-4**
Program:	**Bachelor for Engineering**
Department:	**Physics**
College:	**Sciences**
Institution:	**King Khalid University (KKU)**
Version:	**TP-153-2024**
Last Revision Date:	**29/10/2024**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4h)					
4 (3+1)hrs					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (2nd level/ 1st year)					
4. Course General Description:					
The course includes the basic concepts of physics as units, dimensions, vectors, Motion in one dimension , law of motion and friction, work, Energy and power. It also includes Elastic Properties of Matter, fluid and electric current.					
5. Pre-requirements for this course (if any)**:**					
None					
6. Co-requisites 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.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5h(3+2)/week	100%

No	Mode of Instruction	Contact Hours	Percentage
2	E-learning		
3	Hybrid ● Traditional classroom ● E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	48
2.	**Laboratory/Studio**	32
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		80

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	Define vector, displacement, speed, velocity, force, work, energy, power, pressure, stress, strain, specific heat	K1	Lecture	● Quizzes ● assignments ● Examinations
1.2	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	Differentiate between vectors and scalars, differentiate between speed and velocity,	S1	Lecture	● Quizzes ● assignments ● Examinations

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	concept of work energy principle.			
2.2	Illustrate the concept of equation of continuity, Bernoulli theorem to differentiate between electric field and electric potential.	S2	Lecture	● Quizzes ● assignments ● Examinations
2.3	Apply laws of physics studied in this course to daily life situation.	S3	Lecture	● Practical
2.4	Demonstrate 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	Able to self-learn and solve the tasks.	**C1**	**Lecture**	● Quizzes ● assignments ● Examinations
3.2	Practice communicating with others and cooperating with them	**C1**	**Lecture**	● Quizzes ● assignments ● Examinations
...				

C. Course Content

No	List of Topics	Contact Hours
1.	**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.	6
2.	**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	6
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.	6
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	6
5	**Fluid Mechanics Pressure**, Variation of pressure with depth, Buoyant forces and Archimedes principle, Fluid dynamics, Equation of continuity, Bernoulli's Equation	6
6	**Elasticity**	6

	Elastic properties of Solids, Stress, Strain and Young's modulus of elasticity, Bulk and Shear modulus of elasticity	
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	**3**
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	**3**
9	**Currents and Resistance and Electric Energy and Power** Electric Current, Resistance, Ohm's Law, Electric Power, Resistors in Series and Parallel	**6**
Total		**48**

No	List of Practicals	Contact Hours
1	Measurement of errors by Vernier calipers and micrometer	4
2	Specific heat capacity of solid by the method of mixture	2
3	Mechanical Equivalent of heat through an electrical method	2
4	Surface tension of liquids using the direct pull method. Effect of temperature variation on surface tension.	4
5	Study the effect of light refraction through glass and liquid and determination of their refractive indices.	4
6	Coefficient of viscosity of a viscous liquid by the Stokes method	2
7	Determination of the force constant of a helical spring and the acceleration due to gravity using the spring-mass system	2
8	Correction of visual defects (myopia and hypermetropia) in the eye. Comparison of experimental results with theoretical predictions.	4
9	Observation of the interference pattern from a Young's double slit experiment and estimation of the resolving power of the human eye.	2
10	Study the characteristic curve of a G.M. tube. Measure the attenuation coefficient for metals. Relate the attenuation coefficient to the atomic number.	2
11	Revision	2
Total		**32**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz and Assignments	5th& 12th	10%
2.	Mid Exam	10th	30%
3.	Practical Exam	End of Term	20%
4.	Final Exam	End of Term	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 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 with its facilities that accommodates forty students**
Technology equipment (projector, smart board, software)	**Data show, laptop, smart board and internet.**
Other equipment (depending on the nature of the specialty)	-----

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Indirect method**
Effectiveness of Students assessment	**Course instructor**	**Direct method**
Quality of learning resources	**Students**	**Indirect method**
	Program Leaders Faculty	**Direct and indirect method**
The extent to which CLOs have been achieved	**Course instructor** **Program Leaders Faculty**	**Direct and indirect method**
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Physics Department Council

REFERENCE NO.	The meeting No. 6 for the academic year 1446, recommendation No. 3.6.46
DATE	2/5/1446 H