هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	Principles of Physics
Course Code:	211Phys-4
Program:	Bachelor's in Computer Engineering
Department:	Physics
College:	College of Science
Institution:	King Khalid University
Version:	TP-153-2024
Last Revision Date:	28/10/ 2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4 hours)					
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: (Level 3/ 2nd year)					
4. Course General Description:					
This course focuses on the basic measurement units and vectors, motion in one dimension and motion in two dimensions, Newton's laws of motion, uniform circular motion, work, kinetic energy and potential energy, Momentum, Collisions, Rotational Motion and Equilibrium, Fluids and Archimedes' Principle, Temperature and Heat, fluid dynamics. An overview of the first, second, and third laws of Thermodynamics.					
5. Pre-requirements for this course (if any):					
None					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
After completing this course, the student should be able to know, understand, and use the mathematical concepts and laws related to topics of measurements, units, vectors, motion in 1D and 2D, Newton's laws of motion, energy and energy transfer, potential energy, fluid dynamics and thermodynamics etc. On the other hand, the student will be learning the following. 1. Familiar with types of units and their dimensions and vectors and their laws. 2. Understand the Newton's laws and equations and their applications. 3. Understands the energy and energy transfer concepts and about potential energy. 4. Understand basic concepts related to Pascal's and Archimedes' Principles, equations of Continuity and Bernoulli's. 5. Understand the basic idea of thermodynamics and its laws. 6. Fluent in analyzing practical experiment results and writing reports.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5h(3+2)/week	100 %
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 PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Recognize the basics of physics in mechanics	K1	Open discussion, Problem solving Tutorial discussion Classroom discussions	Quiz, Homework, Mid-term exam, and final exam
1.2	Describe Newton's laws and their applications	K2		
1.3	Understand the concept of flow rate in fluids with the help of equation of continuity and Bernoulli theorem	K3	Open discussion, Problem solving Tutorial discussion	Quiz, Homework, Mid-term

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
			Classroom discussions	exam, and final exam
2.0	**Skills**			
2.1	Use Dimensional analysis of mathematical equations	S1	Solving problem Lectures Derive the mathematical equations	*Discussion *Coursework report. * Quiz. *Final written exam
2.2	Differentiate between the Scalar and Vectors quantities	S2		
2.3	Analyze experimental data	S2		
3.0	**Values, autonomy, and responsibility**			
3.1	Contribute to the teamwork and interaction with others.	V1	Discussion Working groups Dialogue and discussion Working in groups Dialogue and discussions	Evaluate the information that has been assembled by the students individually and collectively IT Duties and presentation
3.2	Practice continuing personal and professional development	V2		

C. Course Content

No	List of Topics	Contact Hours
1.	Measurements, units, vectors: International System of Units, Changing Units, Length, Time, Mass, Vectors and Scalars, Adding Vectors Geometrically, Components of Vectors, Unit Vectors, Adding Vectors by Components, Vectors and the Laws of Physics, Multiplying Vectors Examples and problems	**8**
2.	Motion in one and two dimensions: Motion, Position and Displacement, Average Velocity and Average Speed, Instantaneous Velocity and Speed, Acceleration, Constant Acceleration: A Special Case, Free-Fall Acceleration, Graphical Integration in Motion Analysis, Position and Displacement, Average Velocity and Instantaneous Velocity, Average Acceleration and Instantaneous Acceleration, Projectile Motion Analyzed, Uniform Circular Motion, Examples and problems	**8**
3.	Newton's laws of motion and their applications:	**6**

	Newtonian Mechanics, Newton's First Law, Force, Mass, Newton's Second Law, Some Particular Forces, Newton's Third Law, Applying Newton's Laws Examples and problems	
4.	Momentum, work, kinetic energy and potential energy: Work, Work and Kinetic Energy, Work Done by the Gravitational Force, Work Done by a Spring Force, Work Done by a General Variable Force, Power. Work and Potential Energy, Path Independence of Conservative Forces, Conservation of Mechanical Energy, Momentum, Examples and problems	**8**
5.	Fluid dynamics: Definition of Fluid, Density and Pressure, Fluids at Rest, Measuring Pressure, Pascal's Principle, Archimedes' Principle, Ideal Fluids in Motion, The Equation of Continuity, Bernoulli's Equation Examples and problems	**6**
6.	Thermodynamics: Temperature, The Zeroth Law of Thermodynamics, Measuring Temperature, The Celsius and Fahrenheit Scales, Thermal Expansion, Temperature and Heat, A Closer Look at Heat and Work, The First Law of Thermodynamics, Some Special Cases of the First Law of Thermodynamics, Examples and problems	**6**
7.	Sound waves and Laws of Geometric Optics	**6**
Total		**48**

Lab Experiments:

No	List of Topics	Contact Hours
1	General definition of the laboratory (experiments - reports - graph - safety instructions)	**2**
2	Measurements and errors	**2**
3	Simple pendulum	**2**
4	Spring constant (Hooke's Law)	**3**
5	Surface tension coefficient by capillary tubes	**3**
6	Surface tension coefficient by direct tension	**2**
7	Review of Lab reports	**3**
8	Viscosity coefficient (Stokes method)	**2**
9	Ohm's law	**2**
10	Specific heat capacity (mixing method)	**2**
11	Thin lenses	**2**
13	Refractive index of glass and water (using a sliding microscope)	**3**
14	A review of all laboratory experiments and lab reports with a general discussion	**2**
15	A review of all laboratory experiments and lab reports with a general discussion	**2**
Total (Lab)		**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 Scientist and Engineers, by R. A. Serway and J. W. Jewett, Saunders, 10th edition, 2004.
Supportive References	University Physics: Models and Applications, William P. Crummett, Arthur B. Western, ISBN- 10: 0697111997 ISBN-13: 978-0697111999, William C Brown Pub (January 17, 1994). •Physics, Volume 1 5th Edition, Robert Resnick, David Halliday, Kenneth S. Krane, ISBN-13: 978-0471320579, ISBN-10: 0471320579.
Electronic Materials	Web Sites, Facebook, Twitter, etc. http://library.thinkquest.org/10796 http://www.phys4arab.net/vb/showthread.php?t=7495 http://physics.arabhs.com.
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A classroom with facilities that accommodate 40 students

Items	Resources
Technology equipment (projector, smart board, software)	Data show, laptop, smart board and web.
Other equipment (depending on the nature of the specialty)	Available laboratory

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
The extent to which CLOs have been achieved	Program Leaders. Faculty	Direct and indirect methods
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, the recommendation No. 3.6.46
DATE	2/5/1446 H