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

Course Specification
(Bachelor)

Course Title:	Principles of Physics-1
Course Code:	1308 PHYS-3
Program:	Bachelor's in Computer Engineering
Department:	Physics
College:	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: (3hrs)					
3(2+1)hrs					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☒ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (Level 1 / First 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)**: NO**					
6. Co-requisites for this course (if any)**:No**					
Not Required					
7. Course Main Objective(s):					
The main objective of this course is to improve the ability to think logically about science and technology problems and obtain their solutions. This course aims to offer broad areas of physics, which are essential background knowledge for engineering students. This course will introduce students to how to: • Explain physical phenomena based on the general concepts of physics. • Define general principles of physics. • Solve problems in motion, work, kinetic and potential energy, Temperature, Heat, fluid dynamics and thermal physics.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4 hour (2+2)/week	100%
2	E-learning	0	0 %
3	Hybrid • Traditional classroom	0	0%

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning	0	0 %

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	32
2.	**Laboratory/Studio**	32
3.	**Field**	
4.	**Tutorial**	0
5.	**Others (specify)**	
Total		64

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	Define the basic knowledge about concepts and quantities of physics	K1	Lectures and Discussion	Written examinations Homework Quizzes Oral Exam
1.2	Describe the concepts and principles and recognize the fundamentals of mathematics and physics related to physical sciences.	K2	Lectures and Discussion	Written examinations Homework Quizzes Oral Exam
1.3	Understand the outline of the experimental findings and applications of physics in life.	K3	Lectures and Discussion	Written examinations Homework Quizzes Oral Exam
2.0	**Skills**			
2.1	Show and solve various problems related to engineering physics	S1	Lectures, Tutorials	Examinations, Assignments,

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.2	Carry out experiments and analyze the results of it.	S2	Lab demonstrations	Lab Report, Lab Activity, Lab Examinations
3.0	Values, autonomy, and responsibility			
3.1	Participate commitment to professional and social responsibilities including ethical principles.	V1	Discussions Demonstrations	Faculty Observation, Group report
3.2	Practice communicating with others and cooperating with them.	V2	Discussions, Demonstration, Group work	
3.3	Appraise the self-confidence to enter the job market or integrate graduate programs	V3	Discussions, Demonstration, Group work	

C. Course Content (Theoretical and tutorial part)

No	List of Topics	Contact Hours
1.	**Measurements, units, vectors:** Measuring Things, The 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	6
2.	**Motion in one dimension and motion in 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, Relative Motion in One Dimension, Relative Motion in Two Dimensions. Examples and problems	6
3.	**Newton's laws of motion and their applications:** 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
4.	**Momentum, work, kinetic energy and potential energy.**	6

	What Is Energy, Kinetic 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, Determining Potential Energy Values, Conservation of Mechanical Energy, Reading a Potential Energy Curve, Work Done on a System by an External Force, Conservation of Energy. Examples and problems	
5.	**Thermodynamics:** Temperature, The Zeroth Law of Thermodynamics, Measuring Temperature, The Celsius and Fahrenheit Scales, Thermal Expansion, Temperature and Heat, The Absorption of Heat by Solids and Liquids, A Closer Look at Heat and Work, The First Law of Thermodynamics, Some Special Cases of the First Law of Thermodynamics, Heat Transfer Mechanisms. First, second and third laws of thermodynamics. Examples and problems	6
6.	**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	**4**
Total		**32**

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 pendulum (static state)	**2**
5	Surface tension coefficient by capillary tubes	**2**
6	Surface tension coefficient by direct tension	**3**
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	**3**
12	Refractive index (using a sliding microscope)	**3**
13	A review of all laboratory experiments and lab reports with a general discussion	**2**
14	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 Scientists and Engineers with Modern Physics by Serway and Jewett, Sixth Edition, Cengage Learning, Inc, CA, United States, ISBN: 9781337553292, 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, Robert Resnick, David Halliday, Kenneth S. Krane, 5th Edition, Wiley; 2001. ISBN-13: 978-0471320579, ISBN-10: 0471320579 • Fundamentals of Physics Extended, 10th Edition, David Halliday, Robert Resnick, Jearl Walker, 2013, WILEY Publication. ISBN: 978-1-118-23072-5
Electronic Materials	• www.lms.kku.edu.sa to access lecture notes, text book, lab manual, announcements related to the course etc. www.ieee.org and www.acm.org to search latest research in relevant field.
Other Learning Materials	**NA**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	One lecture room with 50 seats (Available)
Technology equipment (projector, smart board, software)	Data Show (Projectors) in lecture room (Portable projector Available)
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Program Leaders	Direct
Effectiveness of Students assessment	Faculty, Peer Reviewers and Q &D Committee	Direct/Indirect
Quality of learning resources	Programs & Curricula Committee and Q &D Committee	Direct/Indirect
The extent to which CLOs have been achieved	Quality and Development Committee	Indirect
Other	Students, Program Leaders	Direct

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