Course Specification
(Bachelor)

Course Title:	Principles of Physics (1)
Course Code:	**204-PHYS-4**
Program	BS in Computer Science BS in Information Systems BS in Computer and Network Engineering
Department:	Physics Department
College:	College of Science
Institution:	Jazan University, Jazan
Version:	
Last Revision Date:	26/4/2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level -3 / Year 02)					
4. Course general Description:					
This course provides basic concepts for **the physical quantities related to units and dimensions, basic principles of mechanics, heat, fluids, elasticity, electric & magnetic fields and basic ray optics, laws of motion, Newton's laws.**					
5. Pre-requirements for this course (if any)**: None**					
6. Co-requisites for this course (if any)**: None**					
7. Course Main Objective(s):					

This course is designed to provide students with basic principles of:

- Units and dimensions, vectors, motion in one and two dimensions, laws of motion, and rotation of rigid objects.
- Elasticity and fluid mechanics.
- Oscillations, mechanical waves, and sound.
- Temperature and thermodynamics.
- Electric field, electric potential, electric current, resistance and electric power.
- Skills to solve problems regarding the physical principles included.
- Physical experiments to be performed and analyzed.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	60
2	E-learning		
3	Hybrid		

No	Mode of Instruction	Contact Hours	Percentage
	• Traditional classroom • E-learning		
4	Distance learning		
5	Other	30	40

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
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	**Recall** units of physical quantities, vector quantity, scalar quantity, Newton laws, conservation law of mechanical energy, conservation law of linear momentum. Ohm's law, heat, electricity, Coulomb's law, magnetic field, elasticity,	**PLO 1.1**	Lecture, discussion in class and labs	**Direct:** Quiz and mid-term & final Exams. **Indirect**: student survey
1.2	**Define** all the physical quantities related to: unit and dimensions, basic	**PLO 1.2**	Lecture, discussion in class and labs	**Direct:** Quiz and mid-term & final Exams. **Indirect**:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	principles of mechanics, heat, fluids, elasticity, electric& magnetic fields and basic ray optics, laws of motion, Newton's laws			student survey
…				
2.0	Skills			
2.1	**Solve** problems related to dimensional analysis, vectors, rotational dynamics, elasticity, viscosity, laws of motion, heat, sound waves electric & magnetic forces.	**PLO 2.1**	Lecture, discussion in class and labs	**Direct:** Quiz and mid-term & final Exams. **Indirect**: student survey
2.2	**Perform** experiments using different analog and digital devices and plot the characteristics of different types of devices	**PLO 2.2**	Hands on lab demonstrations- guided discussion – guided discovery	Lab report, final exam sheets and assessment.
2.3	**Develop** communication competencies during interactive discussion, group assignments	**PLO 2.3**	Hands on lab demonstrations- guided discussion – guided discovery	Lab report, final exam sheets and assessment.
3.0	Values, autonomy, and responsibility			
3.1	**Demonstrate** skills to work in groups, also take responsibility for other's safety in lab.	**PLO 3.1**	Interactive and Group discussion, expository and discovery teaching	**Direct** (formative and summative): In lab interactive questioning **Indirect**: student survey
3.2				
…				

C. Course Content

Theoretical

No	List of Topics	Contact Hours
1.	**Physics and measurements:** Standards of length, mass, and time, dimensional analysis and conversion of units.	3
2.	**Vectors:** Coordinate systems, vector and scalar quantities, properties of vectors, components of a vector and unit vectors.	4.5.
3.	**Motion in one and two dimensions:** Position, velocity, and speed, instantaneous velocity and speed, particle under constant velocity, acceleration, particle under constant acceleration and freely falling objects.	6
4.	**The laws of motion:** Newton's 1st law and inertial frames**,** Newton's 2nd law, Newton's 3rd law.	3
5.	**Rotation of a rigid object**: Angular position, velocity, and acceleration, rigid object under constant angular acceleration.	3
6.	**Elasticity and fluid mechanics:** Elastic properties of solids, pressure, variation of pressure with depth, pressure measurements, Buoyant forces and Archimedes's principle, fluid dynamics, Bernoulli's Equation, surface tension, capillary action, and viscous fluid flow.	6
7.	**Oscillations and mechanical waves:** Particles in simple harmonic motion**,** the pendulum, speed of sound waves, intensity of periodic sound waves.	4.5
8.	**Thermodynamics:** Temperature and the zeroth law of thermodynamics, thermometers and temperature scales, thermal expansion of solids and liquids, macroscopic description of an ideal gas, heat and internal energy, specific heat and calorimetry, latent heat.	6
9.	**Electricity:** Properties of electric charges, Coulomb's law, electric potential and potential difference, electric current, resistance, resistance and temperature, electrical power**.**	6
10.	**review**	3
Total		45

Experimental

No	List of Topics	Contact Hours
1	Accurate measurements	2
2	Determination of resultant force using force table.	2
3	Verification of Hooke's law of elasticity.	2
4	Determination of acceleration due to gravity using a simple pendulum.	2
5	Determination of the surface tension of liquids.	2

6	Determination of the viscosity of liquids.	2
7	Determination of the velocity of sound in air.	2
8	Determination 0f the specific heat of a solid.	2
9	Determination 0f the thermal expansion coefficient of a solid.	2
10	Determination of resistivity by Ohm's law.	2
11	Determination of unknown resistance using the meter bridge.	2
12	Review& Exam	8
	Total	30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework	2	2.5
2.	Written test	3	2.5
3.	Homework	5	2.5
4.	First mid-term exam	6	10
5.	Homework	8	2.5
6.	Second mid-term exam	12	10
7.	Final practical exam	15	20
8.	Final exam	16	50
	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& Engineers with Modern Physics; Raymond A. Serway and John W. Jewett, Jr.; Brooks/Cole CENGAGE Learning, 9th edition, 2014.
Supportive References	• College Physics; Raymond A. Serway, Charis Vuille, Jerry S. Faughn, Brooks/Cole CENGAGE Learning, 8th edition, 2009. • Fundamentals of Physics; Halliday, Resnik and Walker, John Wiley and Sons Inc., 2007.

Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and laboratories
Technology equipment (projector, smart board, software)	Smart board and projector
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, Peer, and program leader	Indirect (CES) - Indirect peer evaluation
Effectiveness of Students assessment	Students, Program assessment committee	Direct/ Indirect
Quality of learning resources	Students, Faculty members	Indirect
The extent to which CLOs have been achieved	Instructor	Direct/Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Department Council**
REFERENCE NO.	**Psci2415**
DATE	**1/10/2024**