Course Specification

(Bachelor)

Course Title:	**Oscillations and Waves**
Course Code:	**PHYS26231**
Program:	**Physics**
Department:	**Physics**
College:	**Science**
Institution:	**University of Bisha**
Version:	**3**
Last Revision Date:	25 July 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:	3

2. Course type					
A.	University ☐	College ☐	Department☒	Track☐	Others☐
B.	Required ☒	Elective☐			

3. Level/year at which this course is offered:	3rd Level / 2nd year
4. Course general Description	

This course begins by studying a special type of motion called periodic motion. We will focus our attention on simple harmonic motion (SHM), damped oscillations, and forced oscillations. Also, studying the wave motions such as sinusoidal waves, speed of waves in strings, energy transfer by sinusoidal waves on strings, and the linear wave equation. Then studying sound waves, and Doppler effect. and finally studding superposition, interference, and standing waves in strings and air columns.

5. Pre-requirements for this course:

NA

6. Co- requirements for this course:

NA

7. Course Main Objective(s)

Recognize the concepts of oscillatory and waves motion.

2. Teaching mode

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	3	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	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	45

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	Describe various systems of oscillation motion.	K.1	Lectures Solve problems	Written test Reports Homework Quizzes
1.2	Define the waves motion.	K.1		
1.3	Recognize the sound waves and standing waves.	K.1		
2.0	Skills			
2.1	Apply the laws of oscillation motion.	S.1	Lectures Solve problems.	Written test Reports Homework Quizzes
2.2	Solve problems related to the waves motion.	S.1		
2.3	Solve problems in the sound waves and standing waves.	S.1		
3.0	Values, autonomy, and responsibility			
3.1	Exhibit self-learning skills independently.	V.2	Self-learning	Reports Presentation

C. Course Content

No	List of Topics	Contact Hours
1.	**Oscillatory Motion** 1. Motion of an Object Attached to a Spring.	4.5

	2. Particle in Simple Harmonic Motion.	
2.	3. Energy of the Simple Harmonic Oscillator. 4. Comparing Simple Harmonic Motion with Uniform Circular Motion.	4.5
3.	5. The Pendulum (Simple and physical Pendulum). 6. Damped Oscillations. 7. Forced Oscillations	4.5
4.	**Wave Motion** 1. Propagation of a Disturbance. 2. Traveling Wave. 3. The Speed of Waves on Strings	4.5
5.	4. Reflection and Transmission. 5. Rate of Energy Transfer by Sinusoidal Waves on Strings. 6. The Linear Wave Equation.	4.5
6.	**Sound Waves** 1. Pressure Variations in Sound Waves. 2. Speed of Sound Waves.	4.5
7.	3. Intensity of Periodic Sound Waves. 4. The Doppler Effect.	4.5
8.	**Superposition and Standing Waves** 1. Superposition and Interference.	4.5
9.	2. Standing Waves. 3. Waves Under Boundary Conditions.	4.5
10.	4. Resonance. 5. Standing Waves in Air Columns. 6. Standing Waves in Rods and Membranes	4.5
Total		45

Table: The matrix of consistency between the content and the learning outcomes of the course.

	Course Learning Outcomes						
	1.1	1.2	1.3	2.1	2.2	2.3	3.1
Topic 1	√			√			√
Topic 2	√			√			√
Topic 3	√			√			√
Topic 4	√			√			√
Topic 5	√			√			√
Topic 6		√			√		√
Topic 7		√			√		√
Topic 8			√			√	√
Topic 9			√			√	√
Topic 10			√			√	√

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework, quizzes, reports, and presentation.	1: 15	10 %
2.	First term exam	7: 8	20 %
3.	Second term exam	12:13	20 %
4.	Final exam	End of Semester	50 %

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Physics for Scientists and Engineers, 10th Edition, by Raymond A. Serway, John W. Jewett, BROOKS/COLE CENGAGE Learning, Boston USA,ASIN : B00E6TSR92, (2019).
Supportive References	Fundamentals of Physics Extended, 12th Edition, David Halliday, Robert Resnick, Jearl Walker, Wiley, 2021.
Electronic Materials	- Blackboard. - PowerPoint presentations. - Digital library of University of Bisha https://ub.deepknowledge.io/Bisha
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities	Classrooms, Physics lab.
Technology equipment	Data show or smart board.
Other equipment	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Extent of achievement of course learning outcomes.	Teachers, students.	Direct (Final exams), Indirect (Questionnaire).
Effectiveness of teaching.	Teachers, students.	Indirect (Questionnaire)

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of assessment.	Teachers, students.	Indirect (Questionnaire)
Quality of learning resources	Teachers, students.	Indirect (Questionnaire)
Quality of facilities available	Teachers, students.	Indirect (Questionnaire)
Fairness of evaluation	Peer reviewer.	Direct (Final exams reevaluation).

G. Specification Approval Data

COUNCIL /COMMITTEE	College of Science Council
REFERENCE NO.	20
DATE	**17 August 2023**