هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

(Bachelor)

Course Title:	**Classical Mechanics -1**
Course Code:	**PHYS26221**
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 acquires basic knowledge theory and the main experiences of classical mechanics. Concerned with the study of the movement of linear and circular particles, the causes of motions, the law of energy conservation, law of momentum conservation and rotation of a rigid object.

5. Pre-requirements for this course:

NA

6. Co- requirements for this course:

NA

7. Course Main Objective(s)

Recognize the fundamental of classical mechanics.

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		

٣. 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	Define Newton's laws for linear and circular motion.	K.1	Lectures Solve problems	Written test Reports Homework Quizzes
1.2	Describe work and energy theorem.	K.1		
1.3	Recognize linear momentum and collisions.	K.1		
1.4	Identify rotation of a rigid object.	K.1		
2.0	Skills			
2.1	Apply Newton's laws for linear and circular motion.	S.1	Lectures Solve problems.	Written test Reports Homework Quizzes
2.2	Solve problems in work and energy theorem.	S.1		
2.3	Solve problems in linear momentum and collisions.	S.1		
2.4	Apply laws of rotation of a rigid object.	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.	**Motion in Two and Three Dimensions** 1. The Position, Velocity, and Acceleration Vectors. 2. Two-Dimensional Motion with Constant Acceleration. 3. Projectile Motion.	4.5
2.	4. Particle in Uniform Circular Motion. 5. Tangential and Radial Acceleration. 6. Three-Dimensional Motion.	4.5
3.	**The Laws of Motion** 1. Newton's First Law and Inertial Frames. 2. Newton's Second Law. 3. The Gravitational Force and Weight.	4.5
4.	4. Newton's Third Law. 5. Using Newton's Second Law (one example only). 6. Forces of Friction.	4.5
5.	**Circular Motion and Other Applications of Newton's Laws** 1. Extending the Particle in Uniform Circular Motion Model (one example only) 2. Motion in the Presence of Resistive Forces	4.5
6.	**Energy of a System** 1. Work Done by a Constant Force. 2. Work Done by a Varying Force. 3. Kinetic Energy and the Work–Kinetic Energy Theorem.	4.5
7.	4. Potential Energy of a System. 5. Conservative and Non-conservative Forces. 6. Relationship Between Conservative Forces and Potential Energy. **Conservation of Energy** 1.Power.	4.5
8.	**Linear Momentum and Collisions** 1. Linear Momentum. 2. Collisions in One Dimension. 3. The Center of Mass. 4. Systems of Many Particles	4.5
9.	**Rotation of a Rigid Object About a Fixed Axis** 1. Angular Position, Velocity, and Acceleration. 2. Rigid Object Under Constant Angular Acceleration. 3. Angular and Translational Quantities.	4.5
10.	**Rotation of a Rigid Object About a Fixed Axis** 4. Torque. 5. Rigid Object Under a Net Torque. 6. Calculation of Moments of Inertia. 7. Rotational Kinetic Energy.	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	1.4	2.1	2.2	2.3	2.4	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)
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**