هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	Classical Mechanics 1
Course Code:	PHYS 212
Program:	B.Sc. in Physics
Department:	Department of Physics and astronomy
College:	College of Science
Institution:	King Saud University
Version:	2.0.0
Last Revision Date:	Sep 2023

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3(3+0+0)				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:	Fourth level / second year.				
4. Course general Description The course aims to describe the basics concepts and principles of mechanics. The main topics are Brief review of motion in one dimension, motion in two dimensions, Newtonian laws (brief review) and Friction (in details), Circular Motion, Linear and Angular Momentum, Elastic and Inelastic Collisions, Equilibrium, Rigid body Dynamics, Moment of Inertia, Gravitation and Kepler's Laws					
5. Pre-requirements for this course (if any): Phys 110					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s) 1. defining and describing the basics concepts and principles of mechanics. 2. understand and interpret the motion of mechanical systems in terms of classical mechanics formulae. 3. applying a structured process for solving problems in basic classical mechanics					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	45	100%
2.	E-learning	0	0
3.	Hybrid • Traditional classroom • E-learning	0	0
4.	Distance learning	0	0

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	0
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
	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	understand the basics of classical mechanics: dimensions; motion governing laws; Gravity and its application.	K1	• Give extensive examples during lecture. • Give problem sheets to be discussed during lecture..	• Hold Class discussion, tutorial sessions. • Give quizzes, mid-term exam and final exam.
2.0	Skills			
2.1	possess some generic skills such as communication and problem solving in classical mechanics	S1	• Give extensive examples during lecture • Give problem sheets to be discussed during lecture and labs. • assignments. • Discussions in the classes	• Hold Class discussion, tutorial and lab sessions. • Give quizzes, mid-term exam and final exam.
3.0	Values, autonomy, and responsibility			
3.1	Work in a team and acknowledge others' work.	V1	• assignments. • Homework •	Hold Class discussion

C. Course Content

No	List of Topics	Contact Hours
1.	**Motion in one Dimensions:** Brief review	1
2.	**Motion in Two Dimensions:** the position, velocity and acceleration vectors, two-dimensional motion with constant acceleration, projectile motion, analysis model: particle in uniform circular motion, tangential and radial acceleration.	7
3.	**Newton's three laws:** First law with inertial frame, scend and third laws (briefly), analysis models using second law with force of friction (in details).	6
3.	**Circular motion:** extending the particle in uniform circular motion model	3
4.	**Linear momentum and collisions:** linear momentum, analysis model: isolated and non-isolated systems, collisions in one and two dimensions, the center of mass.	6
5.	**Rotation of a rigid object about a fixed axis:** angular position, velocity and acceleration, analysis model: rigid object under constant angular acceleration, angular and translational quantities, Torque, rotational kinetic energy.	8
6.	**Angular momentum:** the vector product and torque, angular momentum of a rotating rigid object.	5
7	**Static Equilibrium and Elasticity:** Analysis model: rigid object in Equilibrium, more on the center of gravity, examples of rigid objects in static equilibrium.	4
8.	**Universal Gravitation:** Newton's law of universal gravitation, Kepler's laws and the motion of planets	5
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First Midterm examination	Approx. 6	15%
2.	Second Midterm examination	Approx. 12	15%
3.	Labs	Weekly	30%
4.	Final examination	From 16 to 18	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, by R. A. Serway and J. W. Jewett, 9th Ed., Publisher: Cengage Learning
Supportive References	Fundamentals of Physics, Binder Ready Version 10th Edition Authors: David Halliday,Robert Resnick ,Jearl Walker Publisher: Wiley; 10 edition (August 5, 2013)
Electronic Materials	None
Other Learning Materials	Internet sites relevant to the course

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A classroom which accommodates 25 students.
Technology equipment (projector, smart board, software)	Whiteboard and Smart board
Other equipment (depending on the nature of the specialty)	Not applicable

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students\ Peer Reviewer	Indirect \ direct
Effectiveness of students assessment	Students- Faculty	Direct
Quality of learning resources	students	Indirect
The extent to which CLOs have been achieved	Faculty	Indirect
Other	None	None

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Physics Department's council
REFERENCE NO.	4th (1st term/1445)
DATE	11/10/2023