هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**General Physics 2**
Course Code:	**PHY1102**
Program:	**Physics**
Department:	**Physics**
College:	**Applied Science**
Institution:	**Umm Al-Qura University**

Table of Contents

A. Course Identification

1. Credit hours: 4
2. Course type **a.** University ☐ College ☐ Department ☑ Others ☐ **b.** Required ☑ Elective ☐
3. Level/year at which this course is offered: Level 2nd / 1st year
4. Pre-requisites for this course (if any): **General Physics 1**
5. Co-requisites for this course (if any):

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	40	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	40
2	Laboratory/Studio	
3	Tutorial	
4	Others	
	Total	40

B. Course Objectives and Learning Outcomes

1. Course Description

The course will cover the principle of mechanics, such as particle dynamics, system of particles, collisions, rotational kinematics, rotational dynamics, fluid mechanics, etc.

2. Course Main Objective

After completing this course student should be able to:

1. Define the concepts of the work and potential energy.
2. Define the concepts of the center of mass.
3. Define the concepts of motion of a circular path.
4. Define the concepts of torque and angular momentum.
5. Define the concepts of the gravitational.

6. Define the concepts of the fluid mechanics.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Define the physical quantities related to the mechanics of the body, as well as fluid mechanics.	K1
1.2	Describe the concepts and physical laws related to mechanics of the body as well as the fluid mechanics using the mathematical formula.	K2
1.3		
2	**Skills:**	
2.1	Apply physics laws to calculate physical quantities related to the mechanics of the body as well as the fluid mechanics.	S1
2.2	Explain the procedures for scientific theoretical treatments.	S2
2.3		
3	**Values:**	
3.1	Work effectively responsibly in teamwork	V2
3.2		

C. Course Content

No	List of Topics	Contact Hours
1	**Kinetic Energy and Work** • 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	5
2	**Potential Energy and Conservation of Energy** • 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	5
3	**Center of Mass and Linear Momentum** • The Center of Mass • Newton's Second Law for a System of Particles • Linear Momentum • The Linear Momentum of a System of Particles • Collision and Impulse • Conservation of Linear Momentum • Momentum and Kinetic Energy in Collisions • Inelastic Collisions in One Dimension • Elastic Collisions in One Dimension • Collisions in Two Dimensions • Systems with Varying Mass: A Rocket	5

4	**Rotation** • Rotational Variables • Are Angular Quantities Vectors? • Rotation with Constant Angular Acceleration • Relating the Linear and Angular Variables • Kinetic Energy of Rotation • Calculating the Rotational Inertia • Torque • Newton's Second Law for Rotation • Work and Rotational Kinetic Energy	5
5	**Rolling, Torque, and Angular Momentum** • Rolling as Translation and Rotation Combined • The Kinetic Energy of Rolling • The Forces of Rolling • The Yo-Yo • Torque Revisited • Angular Momentum • Newton's Second Law in Angular Form • The Angular Momentum of a System of Particles • The Angular Momentum of a Rigid Body Rotating About a Fixed Axis • Conservation of Angular Momentum • Precession of a Gyroscope	5
6	**Equilibrium and Elasticity** • Equilibrium • The Requirements of Equilibrium • The Center of Gravity • Some Examples of Static Equilibrium • Indeterminate Structures • Elasticity	5
7	**Gravitation** • Newton's Law of Gravitation • Gravitation and the Principle of Superposition • Gravitation Near Earth's Surface • Gravitation Inside Earth • Gravitational Potential Energy • Planets and Satellites: Kepler's Laws • Satellites: Orbits and Energy • Einstein and Gravitation	5
8	**Fluids** • What is a 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	5
Total		40

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Define the physical quantities related to the mechanics of the body.	1. Demonstrating the basic principles through lectures. 2. Discussing phenomena with illustrating pictures and diagrams. 3. Lecturing method: • Board, Power point. • Discussions • Brain storming • Start each chapter by general idea and the benefit of it. 4. Do some experimental in the Laboratory	1. Solve some examples during the lecture. 2. Discussions during the lectures 3. Exams: a) Quizzes b) Midterm exams c) Final exam. d) Practical exams.
1.2	Describe the concepts and physical laws related to mechanics using the mathematical formula.		
2.0	**Skills**		
2.1	Apply physics laws to calculate physical quantities related to the mechanics of the body.	1. Solve some problems in physics during lectures. 2. Following some proofs during lectures. 3. Encourage students to participate in solving problems.	1. Solve some examples during the lecture. 2. Discussions during the lectures 3. Exams: a) Quizzes b) Midterm exams c) Final exam. d) Practical exams.
2.2	Explain the procedures for scientific theoretical treatments.		
3.0	**Values**		
3.1	Work effectively responsibly in teamwork	• Organize the students as a small group (teamwork). • Give students tasks of duties as a small project.	• Evaluate the scientific reports. • Discussing the reports with each teamwork. • Evaluate the efforts of each student in preparing the report..
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm Exam	7th	30 %
2	HomeWorks & Quizzes & reports	All weeks	20 %
3	Final Exam	End of the semester	50%
4			

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Each student will be supervised by academic adviser in Physics Department and the time table for academic advice were given to the student each semester. (4 hrs per week)

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Halliday & Resnick, Jearl Walker, "Fundamentals of Physics" 10th Edition (2018)
Essential References Materials	Physics for Scientists & Engineers with Modern Physics 4th Edition by Douglas Giancoli, 4th Edition (2014).
Electronic Materials	1. Physics is Beautiful | Free, interactive physics lessons 2. Khan Academy Physics | Physics videos 3. The Feynman Lectures on Physics 4. PhET Simulations | Online physics simulations
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• Classroom • Library
Technology Resources (AV, data show, Smart Board, software, etc.)	• Data show • Black Bord
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching Strategies	Students	Questionnaire
Effectiveness of student assessment	Instructor	Exams
Extent of achievement of course learning outcomes	Instructor	Course report
Quality of learning resources	Instructor	Course report

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	

Date	