Jordan University of Science and Technology

Faculty of Science & Arts

Physics Department

PHY103 General Physics
First Semester 2017-2018

Course Catalog
3 Credit Hours. Classical Physics, Vectors, One dimensional motion, Newton?s laws, Work and energy, Rotational motion, Static equilibrium of rigid bodies, Elasticity, Vibrations and waves, Sound waves, flow of non-viscous fluids, Electric Charge and Electric Field, Electric potential and electric potential energy, Capacitors, Electric current, DC circuits, Magnetism, Light: Geometrical Optics.

Text Book	
Title	Physics for Scientists and Engineers
Author(s)	Giancoli
Edition	7th Edition
Short Name	Physics for Scientists and Engineers
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
College Physics	College Physics	Serway& Faughn.	3rd Edition	
Contemporary College Physics	Contemporary College Physics	Jones & Childers.	3rd Edition	
Physics	Physics	Kane and Sternheim	3rd Edition	

Class Schedule & Room

Section 1:
Lecture Time: Sun, Tue, Thu : 08:30 - 09:30
Room: NF40

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Weeks 1, 2	Ch. 2: Describing Motion: Kinematics in one dimension: Reference frames and Displacement, Average velocity, Instantaneous velocity, Acceleration, Motion at constant acceleration, Solving problems, Falling Objects. 2.1 (Pg. 22), 2.2 (Pg. 23), 2.3 (Pg. 25), 2.4 (Pg. 26), 2.5 (Pg. 28), 2.6 (Pg. 30)and 2.7 (Pg. 33)	From **Physics for Scientists and Engineers**
Weeks 3, 4	Ch. 3: Kinematics in Two Dimensions; Vectors: Vectors and Scalars, Addition of Vectors-Graphical Methods, Subtraction of Vectors, and Multiplication of a Vector by a Scalar, Multiplication of vectors (Scalar and vector products), Adding Vectors by Components. 3.1 (Pg. 50), 3.2 (Pg. 50), 3.3 (Pg. 52), 3.4 (Pg. 53)	From **Physics for Scientists and Engineers**
Week 5	Ch. 4: Dynamics: Newton?s Laws of Motion: Newton?s First Law of Motion, Newton?s Second Law of Motion, Newton?s Third First Law of Motion, Weight-the Force of Gravity; and the Normal Force, Solving Problems with Newton?s Lows: Free Body Diagrams, Problems Involving Friction, Inclines. 4.2 (Pg. 76), 4.4 (Pg. 78), 4.5 (Pg. 81), 4.6 (Pg. 84), 4.7 (Pg. 87), 4.8 (Pg. 93)	From **Physics for Scientists and Engineers**
Week 6	Ch. 6: Work and Energy: Work done by a constant force, Kinetic energy, and the Work-Energy Principle, potential energy. 6.1 (Pg. 138), 6.3 (Pg. 142), 6.4 (Pg. 145	From **Physics for Scientists and Engineers**
Week 7	Ch. 8: Rotational Motion: Torque. 8.4 (Pg. 206). Ch. 9 Static Equilibrium; Elasticity and Fracture: The Concept of Equilibrium, Solving Statics Problems, Elasticity;Stress. 9.1 (Pg. 231), 9.2 (Pg. 233), 9.3 (Pg. 238), 9.3 (Pg. 241)	From **Physics for Scientists and Engineers**
Week 8	Ch. 10: Fluids: Pressure in fluids, Atmospheric Pressure and Gauge Pressures, Buoyant and Archimedes? Principle, Fluids in Motion; Flow Rate and the Equation of Continuity; Streamline Flow, Bernoulli?s Equation, Static Consequences of Bernoulli?s Equation, Applications of Bernoulli?s Principle.	From **Physics for Scientists and Engineers**
Week 9	Ch. 11: Vibrations and Waves: Wave Motion, Speed of Longitudinal waves. 11.7 (Pg. 305), 11.8 (Pg. 307)	From **Physics for Scientists and Engineers**
Week 9	Ch. 12: Sound: Characteristic of sound, Intensity of sound: Decibels, The Ear and Its Response; Loudness. 12.1 (Pg. 328), 12.2 (Pg. 331), 12.3 (Pg. 334)	From **Physics for Scientists and Engineers**

Week 10	Ch. 16: Electric Charge and Electric Field: Coulombs Law, Solving Problems Involving Coulombs Law and Vectors, The Electric Field, Field Lines. 16.5 (Pg. 447), 16.6 (Pg. 450), 16.7 (Pg. 453), 16.8 (Pg. 457)	From **Physics for Scientists and Engineers**
Week 11	Ch.17: Electric Potential: Electric Potential and Potential Energy, Relation between Electric Potential and Electric Field, Electric Potential Due to Point Charges, Capacitance, Stored of Electric Energy. 17.1 (Pg. 474), 17.2 (Pg. 477), 17.5 (Pg. 479), 17.7 (Pg. 482), 17.9 (Pg. 486)	From **Physics for Scientists and Engineers**
Week 12	Ch. 18: Direct Currents: Electric Current (No internal resistance), Ohm?s law Resistance and Resistors (No temperature effect), Resistivity, 18.2 (Pg. 504), 18.3 (Pg. 505), 18.4 (Pg. 508)Ch. 19 DC Circuits: Resistors in Series and Parallel	From **Physics for Scientists and Engineers**
Week 13	Ch. 20: Magnetism: Magnets and Magnetic Field, Electric Currents Produce Magnetic Field, Force on a Electric Charge Moving in a Magnetic Field, Magnetic Force on a Current-Carrying Wire, Magnetic Fields Produced by Currents. 20.1 (Pg. 560), 20.2 (Pg. 563), 20.4 (Pg. 566), 20.5 (Pg. 570)	From **Physics for Scientists and Engineers**
Week 14	Ch. 23: Light: Geometrical Optics: Thin Lenses; Ray Tracing, The Thin Lens Equation; Magnification. 23.7 (Pg. 661), 23.8 (Pg. 664)	From **Physics for Scientists and Engineers**

Mapping of Course Objectives to Program Student Outcomes[1]	**Assessment method**
1- Define the vector, scalar and the relationship between them. Distinguish between vector and scalar physical quantities. [1(a)]	
Describe variables of motion including displacement, speed, velocity and acceleration. Understand one-dimensional motion with constant acceleration and understand free falling motion as an example. Understand the dynamics of motion and solve different kinds of problems on dynamics of motion including smooth and rough surfaces. Define the concept of work and energy transfer. Understanding the work-energy theorem and the concept of potential energy. [1(e)]	
Understand the elastic properties of materials and introduce the concept of stress and strain. Define Young?s modulus of elasticity. [1(j)]	
State Archimedes Principle and use this principle to solve problems related to buoyant force.Explain what is meant by streamline flow, the equation of continuity, and the flow rate. Use Bernoulli's equation and the concept of streamline flow to solve for the velocity of a fluid and/or the pressure exerted by a fluid at a particular point in a closed pipe. [1(e), 1(h)]	
Understand Electrostatics. Introduce Coulomb?s law and the concept of electric charge. Introduce the concept of electric field and the calculation of total electric field vector for a discrete distribution of electric charges. Understand the concept of electric potential and electric potential energy. Understand what is a capacitor and the functioning of capacitors in storing electric charge and electric potential energy. [1(a), 1(e)]	

Introducing geometrical optics and discuss lenses and mirrors as optical instruments. Introducing the concept of Electromagnetic radiation. [1(a), 1(i), 1(j)]	

Relationship to Program Student Outcomes (Out of 100%)										
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
29.17				42.50			5	6.67	16.67	

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