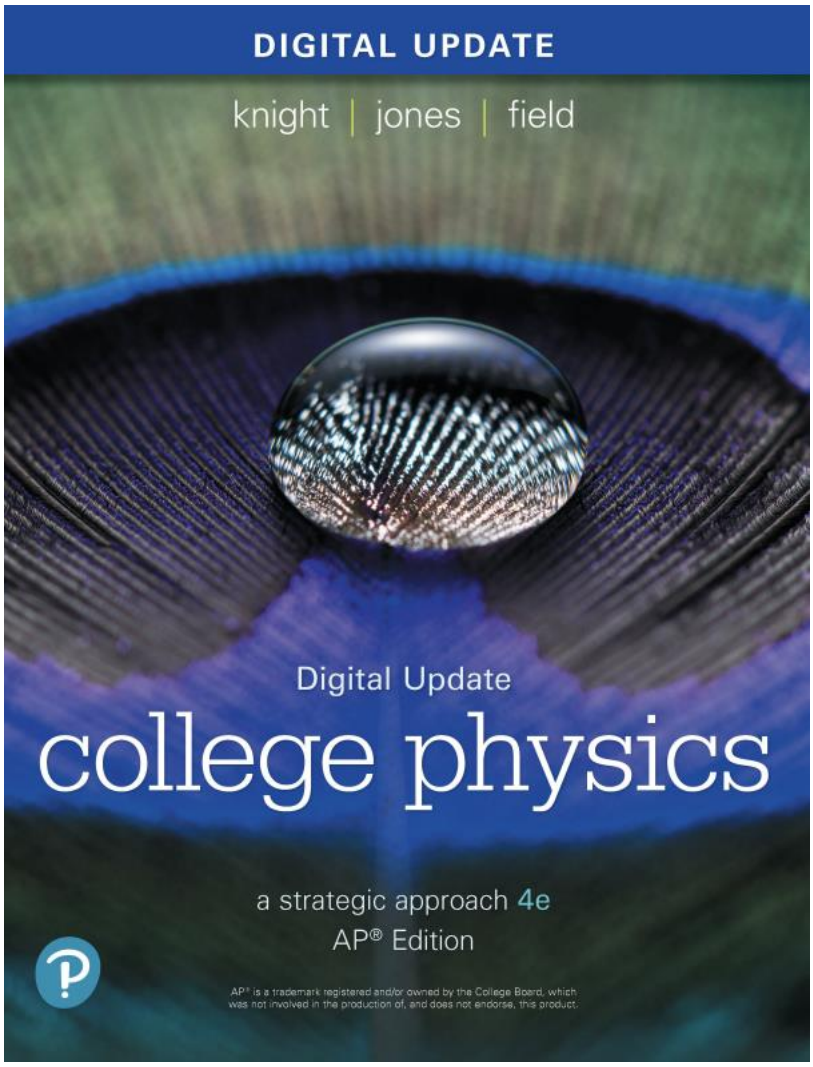
A Correlation of
College Physics:
A Strategic Approach 4th Edition, AP® Edition ©2019
4th Edition, AP® Edition Digital Update ©2023



To the
AP® Physics 1 Course Framework
Effective Fall 2024

Pearson

Table of Contents

The units above reflect the College Board's AP® Physics 1 Course Framework.

Unit 1: Kinematics (5 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
1.1 Scalars and Vectors in One dimension	1.1.A Describe a scalar or vector quantity using magnitude and direction, as appropriate. 1.1.B Describe a vector sum in one dimension.	1.6 Vectors and Motion: A First Look
1.2 Displacement, Velocity, and Acceleration	1.2.A Describe a change in an object's position. 1.2.B Describe the average velocity and acceleration of an object.	1.3 Position and Time: Putting Numbers on Nature 1.4 Velocity 1.6 Vectors and Motion: A First Look 2.4 Acceleration
1.3 Representing Motion	1.3.A Describe the position, velocity, and acceleration of an object using representations of that object's motion.	2.1 Describing Motion 2.2 Uniform Motion 2.3 Instantaneous Velocity 2.4 Acceleration 2.5 Motion with Constant Acceleration 2.7 Free Fall
1.4 Reference Frames and Relative Motion	1.4.A Describe the reference frame of a given observer. 1.4.B Describe the motion of objects as measured by observers in different inertial reference frames.	3.8 Relative Motion 27.2 Galilean Relativity
1.5 Vectors and Motion in Two Dimensions	1.5.A Describe the perpendicular components of a vector. 1.5.B Describe the motion of an object moving in two dimensions.	3.1 Using Vectors 3.2 Coordinate Systems and Vector Components 3.3 Motion on a Ramp 3.4 Motion in Two Dimensions 3.5 Projectile Motion 3.6 Projectile Motion: Solving Problems

Unit 2: Force and Translational Dynamics (9 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
2.1 Systems and Center of Mass	2.1.A Describe the properties and interactions of a system. 2.1.B Describe the location of a system's center of mass with respect to the system's constituent parts.	7.4 Gravitational Torque and the Center of Gravity 9.4 Conservation of Momentum
2.2 Forces and Free-Body Diagrams	2.2.A Describe a force as an interaction between two objects or systems. 2.2.B Describe the forces exerted on an object or system using a free-body diagram.	4.1 Motion and Forces 4.2 A Short Catalog of Forces 4.3 Identifying Forces 4.6 Free-Body Diagrams
2.3 Newton's Third Law	2.3.A Describe the interaction of two objects using Newton's third law and a representation of paired forces exerted on each object.	4.7 Newton's Third Law 5.7 Interacting Objects 5.8 Ropes and Pulleys
2.4 Newton's First Law	2.4.A Describe the conditions under which a system's velocity remains constant.	4.1 Motion and Forces
2.5 Newton's Second Law	2.5.A Describe the conditions under which a system's velocity changes.	4.4 What Do Forces Do? 4.5 Newton's Second Law 5.2 Dynamics and Newton's Second Law

Unit 2: Force and Translational Dynamics (9 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
2.6 Gravitational Force	2.6.A Describe the gravitational interaction between two objects or systems with mass. 2.6.B Describe situations in which the gravitational force can be considered constant. 2.6.C Describe the conditions under which the magnitude of a system's apparent weight is different from the magnitude of the gravitational force exerted on that system. 2.6.D Describe inertial and gravitational mass.	4.2 A Short Catalog of Forces 5.3 Mass and Weight 6.3 Apparent Forces in Circular Motion 6.4 Circular Orbits and Weightlessness 6.5 Newton's Law of Gravity
2.7 Kinetic and Static Friction	2.7.A Describe kinetic friction between two surfaces. 2.7.B Describe static friction between two surfaces.	4.2 A Short Catalog of Forces 5.4 Normal Forces 5.5 Friction
2.8 Spring Forces	2.8.A Describe the force exerted on an object by an ideal spring.	4.2 A Short Catalog of Forces 8.3 Springs and Hooke's Law

2.9 Circular Motion	2.9.A Describe the motion of an object traveling in a circular path. 2.9.B Describe circular orbits using Kepler's third law.	3.7 Circular Motion 6.1 Uniform Circular Motion 6.2 Dynamics of Uniform Circular Motion 6.4 Circular Orbits and Weightlessness 6.6 Gravity and Orbits 7.2 The Rotation of a Rigid Body

Unit 3: Work, Energy, and Power (5 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
3.1 Translational Kinetic Energy	3.1.A Describe the translational kinetic energy of an object in terms of the object's mass and velocity.	10.1 The Basic Energy Model 10.3 Kinetic Energy
3.2 Work	3.2.A Describe the work done on an object or system by a given force or collection of forces.	10.1 The Basic Energy Model 10.2 Work 10.5 Thermal Energy
3.3 Potential Energy	3.3.A Describe the potential energy of a system.	10.1 The Basic Energy Model 10.4 Potential Energy
3.4 Conservation of Energy	3.4.A Describe the energies present in a system. 3.4.B Describe the behavior of a system using conservation of mechanical energy principles. 3.4.C Describe how the selection of a system determines whether the energy of that system changes.	10.1 The Basic Energy Model 10.6 Conservation of Energy 10.7 Energy Diagrams

3.5 Power	3.5.A Describe the transfer of energy into, out of, or within a system in terms of power.	10.10 Power

Unit 4: Linear Momentum (4 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
4.1 Linear Momentum	4.1.A Describe the linear momentum of an object or system.	9.2 Momentum and the Impulse-Momentum Theorem
4.2 Change in Momentum and Impulse	4.2.A Describe the impulse delivered to an object or system. 4.2.B Describe the relationship between the impulse exerted on an object or a system and the change in momentum of the object or system.	9.1 Impulse 9.2 Momentum and the Impulse-Momentum Theorem 9.3 Solving Impulse and Momentum Problems
4.3 Conservation of Linear Momentum	4.3.A Describe the behavior of a system using conservation of linear momentum.	9.4 Conservation of Momentum 9.6 Momentum and Collisions in Two Dimensions
4.4 Elastic and Inelastic Collisions	4.4.A Describe whether an	9.5 Inelastic Collisions 9.6 Momentum and Collisions in Two Dimensions 10.9 Energy in Collisions

	interaction between objects is elastic or inelastic.	

Unit 5: Torque and Rotational Dynamics (6 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
5.1 Rotational Kinematics	5.1.A Describe the rotation of a system with respect to time using angular displacement, angular velocity, and angular acceleration.	7.1 Describing Circular and Rotational Motion 7.2 The Rotation of a Rigid Body
5.2 Connecting Linear and Rotational Motion	5.2.A Describe the linear motion of a point on a rotating rigid system that corresponds to the rotational motion of that point, and vice versa.	7.1 Describing Circular and Rotational Motion 7.2 The Rotation of a Rigid Body
5.3 Torque	5.3.A Identify the torques exerted on a rigid system. 5.3.B Describe the torques exerted on a rigid system.	7.3 Torque 7.4 Gravitational Torque and the Center of Gravity

5.4 Rotational Inertia	5.4.A Describe the rotational inertia of a rigid system relative to a given axis of rotation. 5.4.B Describe the rotational inertia of a rigid system rotating about an axis that does not pass through the system's center of mass.	7.5 Rotational Dynamics and Moment of Inertia
5.5 Rotational Equilibrium and Newton's First Law in Rotational Form	5.5.A Describe the conditions under which a system's angular velocity remains constant.	5.1 Equilibrium 8.1 Torque and Static Equilibrium
5.6 Newton's Second Law in Rotational Form	5.6.A Describe the conditions under which a system's angular velocity changes.	7.5 Rotational Dynamics and Moment of Inertia 7.6 Using Newton's Second Law for Rotation
Unit 6: Energy and Momentum of Rotating Systems (6 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
6.1 Rotational Kinetic Energy	6.1.A Describe the rotational kinetic energy of a rigid system in terms of the rotational inertia and angular velocity of that rigid system.	10.3 Kinetic Energy
6.2 Torque and Work	6.2.A Describe the work done on a rigid system by a given torque or collection of torques.	(none)
6.3 Angular Momentum and Angular Impulse	6.3.A Describe the angular momentum of an object or rigid system.	9.7 Angular Momentum

	6.3.B Describe the angular impulse delivered to an object or rigid system by a torque. 6.3.C Relate the change in angular momentum of an object or rigid system to the angular impulse given to that object or rigid system.	
6.4 Conservation of Angular Momentum	6.4.A Describe the behavior of a system using conservation of angular momentum. 6.4.B Describe how the selection of a system determines whether the angular momentum of that system changes.	9.7 Angular Momentum

Unit 6: Energy and Momentum of Rotating Systems (6 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
6.5 Rolling	6.5.A Describe the kinetic energy of a system that has translational and rotational motion. 6.5.B Describe the motion of a system that is rolling without slipping. 6.5.C Describe the motion of a system that is rolling while slipping.	7.7 Rolling Motion 10.3 Kinetic Energy

6.6 Motion of Orbiting Satellites	6.6.A Describe the motions of a system consisting of two objects interacting only via gravitational forces.	(none)

Unit 7: Oscillations (4 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
7.1 Defining Simple Harmonic Motion (SHM)	7.1.A Describe simple harmonic motion.	14.1 Equilibrium and Oscillation 14.2 Linear Restoring Forces and SHM
7.2 Frequency and Period of SHM	7.2.A Describe the frequency and period of an object exhibiting SHM.	14.1 Equilibrium and Oscillation 14.4 Energy in Simple Harmonic Motion 14.5 Pendulum Motion
7.3 Representing and Analyzing SHM	7.3.A Describe the displacement, velocity, and acceleration of an object exhibiting SHM.	14.3 Describing Simple Harmonic Motion

7.4 Energy of Simple Harmonic Oscillators	7.4.A Describe the mechanical energy of a system exhibiting SHM.	14.4 Energy in Simple Harmonic Motion

Unit 8: Fluids (4 topics) AP® Physics 1 Course Framework		
Topic	**Learning Objectives**	**College Physics: A Strategic Approach Chapters and Sections**
8.1 Internal Structure and Density	8.1.A Describe the properties of a fluid.	13.1 Fluids and Density
8.2 Pressure	8.2.A Describe the pressure exerted on a surface by a given force. 8.2.B Describe the pressure exerted by a fluid.	13.2 Pressure

8.3 Fluids and Newton's Laws	8.3.A Describe the conditions under which a fluid's velocity changes. 8.3.B Describe the buoyant force exerted on an object interacting with a fluid.	13.3 Buoyancy
8.4 Fluids and Conservation Laws	8.4.A Describe the flow of an incompressible fluid through a cross-sectional area by using mass conservation. 8.4.B Describe the flow of a fluid as a result of a difference in energy between two locations within the fluid–Earth system.	13.4 Fluids in Motion 13.5 Fluid Dynamics