AP® Physics C: Mechanics

Course at a Glance

Plan

The Course at a Glance provides a useful visual organization for the AP Physics C: Mechanics course components, including:

- Sequence of units, along with approximate weighting and suggested pacing. Note, suggested pacing options are provided for both 45-minute periods meeting daily for a full year and for 90-minute periods meeting daily for a single semester.
- Progression of topics within each unit.
- Spiraling of the science practices across units.

Teach

PRACTICES

Science Practices spiral throughout the course.

1 Creating Representations

2 Mathematical Routines

3 Scientific Questioning and Argumentation

Required Course Content

Each topic contains required Learning Objectives and Essential Knowledge statements that form the basis of the assessment on the AP Exam.

Assess

Assign the Progress Checks—either as homework or in class—for each unit. Each Progress Check contains formative multiple-choice and free-response questions. The feedback from these checks shows students the areas where they need to focus.

UNIT 1

Kinematics

~14–19 CLASS PERIODS

10–15% AP EXAM WEIGHTING

Skill	Topic
1 2 3	1.1 Scalars and Vectors
1 2 3	1.2 Displacement, Velocity, and Acceleration
1 2 3	1.3 Representing Motion
1 2 3	1.4 Reference Frames and Relative Motion
1 2 3	1.5 Motion in Two or Three Dimensions

Progress Check 1

Multiple-choice: ~18 questions
Free-response: 4 questions
- Mathematical Routines
- Translation Between Representations
- Experimental Design and Analysis
- Qualitative/Quantitative Translation

UNIT 2

Force and Translational Dynamics

~15–25 CLASS PERIODS

20–25% AP EXAM WEIGHTING

Skill	Topic
1 2 3	2.1 Systems and Center of Mass
1 2 3	2.2 Forces and Free-Body Diagrams
1 2 3	2.3 Newton's Third Law
1 2 3	2.4 Newton's First Law
1 2 3	2.5 Newton's Second Law
1 2 3	2.6 Gravitational Force
1 2 3	2.7 Kinetic and Static Friction
1 2 3	2.8 Spring Forces
1 2 3	2.9 Resistive Forces
1 2 3	2.10 Circular Motion

Progress Check 2

Multiple-choice: ~30 questions
Free-response: 4 questions
- Mathematical Routines
- Translation Between Representations
- Experimental Design and Analysis
- Qualitative/Quantitative Translation

UNIT 3

Work, Energy, and Power

~12–17 CLASS PERIODS

15–25% AP EXAM WEIGHTING

Skill	Topic
1 2 3	3.1 Translational Kinetic Energy
1 2 3	3.2 Work
1 2 3	3.3 Potential Energy
1 2 3	3.4 Conservation of Energy
1 2 3	3.5 Power

Progress Check 3

Multiple-choice: ~18 questions
Free-response: 4 questions
- Mathematical Routines
- Translation Between Representations
- Experimental Design and Analysis
- Qualitative/Quantitative Translation

UNIT 4

Linear Momentum

~11–15 CLASS PERIODS

10–20% AP EXAM WEIGHTING

Skill	Topic
1 2 3	4.1 Linear Momentum
1 2 3	4.2 Change in Momentum and Impulse
1 2 3	4.3 Conservation of Linear Momentum
1 2 3	4.4 Elastic and Inelastic Collisions

Progress Check 4

Multiple-choice: ~18 questions
Free-response: 4 questions
- Mathematical Routines
- Translation Between Representations
- Experimental Design and Analysis
- Qualitative/Quantitative Translation

UNIT 5

Torque and Rotational Dynamics

~14–20 CLASS PERIODS

10–15% AP EXAM WEIGHTING

Skill	Topic
1 2 3	5.1 Rotational Kinematics
1 2 3	5.2 Connecting Linear and Rotational Motion
1 2 3	5.3 Torque
1 2 3	5.4 Rotational Inertia
1 2 3	5.5 Rotational Equilibrium and Newton's First Law in Rotational Form
1 2 3	5.6 Newton's Second Law in Rotational Form

Progress Check 5

Multiple-choice: ~18 questions
Free-response: 4 questions
- Mathematical Routines
- Translation Between Representations
- Experimental Design and Analysis
- Qualitative/Quantitative Translation

UNIT 6

Energy and Momentum of Rotating Systems

~13–19 CLASS PERIODS

10–15% AP EXAM WEIGHTING

Skill	Topic
1 2 3	6.1 Rotational Kinetic Energy
1 2 3	6.2 Torque and Work
1 2 3	6.3 Angular Momentum and Angular Impulse
1 2 3	6.4 Conservation of Angular Momentum
1 2 3	6.5 Rolling
1 2 3	6.6 Motion of Orbiting Satellites

Progress Check 6

Multiple-choice: ~18 questions
Free-response: 4 questions
- Mathematical Routines
- Translation Between Representations
- Experimental Design and Analysis
- Qualitative/Quantitative Translation

UNIT 7

Oscillations

~12–17 CLASS PERIODS

10–15% AP EXAM WEIGHTING

Skill	Topic
1 2 3	7.1 Defining Simple Harmonic Motion (SHM)
1 2 3	7.2 Frequency and Period of SHM
1 2 3	7.3 Representing and Analyzing SHM
1 2 3	7.4 Energy of Simple Harmonic Oscillators
1 2 3	7.5 Simple and Physical Pendulums

Progress Check 7

Multiple-choice: ~18 question
Free-response: 4 questions
- Mathematical Routines
- Translation Between Representations
- Experimental Design and Analysis
- Qualitative/Quantitative Translation