

AP[®] Calculus
AB and BC

Your Course
at a Glance

Plan

The Course at a Glance provides a useful visual organization of the AP Calculus AB and AP Calculus BC curricular components, including:

- Sequence of units, along with approximate weighting and suggested pacing. Please note, pacing is based on 45-minute class periods, meeting five days each week for a full academic year.
- Progression of topics within each unit.
- Spiraling of the big ideas and mathematical practices across units.

Teach

MATHEMATICAL PRACTICES

Mathematical practices spiral throughout the course.

- 1

Implementing Mathematical Processes
- 2

Connecting Representations
- 3

Justification
- 4

Communication and Notation

BIG IDEAS

Big ideas spiral across topics and units.

- CHA

Change
- LIM

Limits
- FUN

Analysis of Functions

BC ONLY The purple shading represents BC only content.

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 the Progress Checks shows students the areas where they need to focus.

<div><div>UNIT 1</div><div>Limits and Continuity</div><div><div>AP EXAM WEIGHTING</div><div>10–12% AB4–7% BC</div><div>CLASS PERIODS</div><div>~22–23 AB~13–14 BC</div></div><div><div>CHA2</div><div>1.1</div><div>Introducing Calculus: Can Change Occur at an Instant?</div></div><div><div>LIM2</div><div>1.2</div><div>Defining Limits and Using Limit Notation</div></div><div><div>LIM2</div><div>1.3</div><div>Estimating Limit Values from Graphs</div></div><div><div>LIM2</div><div>1.4</div><div>Estimating Limit Values from Tables</div></div><div><div>LIM1</div><div>1.5</div><div>Determining Limits Using Algebraic Properties of Limits</div></div><div><div>LIM1</div><div>1.6</div><div>Determining Limits Using Algebraic Manipulation</div></div><div><div>LIM1</div><div>1.7</div><div>Selecting Procedures for Determining Limits</div></div><div><div>LIM3</div><div>1.8</div><div>Determining Limits Using the Squeeze Theorem</div></div><div><div>LIM2</div><div>1.9</div><div>Connecting Multiple Representations of Limits</div></div><div><div>LIM3</div><div>1.10</div><div>Exploring Types of Discontinuities</div></div><div><div>LIM3</div><div>1.11</div><div>Defining Continuity at a Point</div></div><div><div>LIM1</div><div>1.12</div><div>Confirming Continuity over an Interval</div></div><div><div>LIM1</div><div>1.13</div><div>Removing Discontinuities</div></div><div><div>LIM3</div><div>1.14</div><div>Connecting Infinite Limits and Vertical Asymptotes</div></div><div><div>LIM2</div><div>1.15</div><div>Connecting Limits at Infinity and Horizontal Asymptotes</div></div><div><div>FUN3</div><div>1.16</div><div>Working with the Intermediate Value Theorem (IVT)</div></div><div><div>Progress Check 1</div><div>Multiple-choice: ~45 questions Free-response: 3 questions (partial)</div></div></div>	<div><div>UNIT 2</div><div>Differentiation: Definition and Basic Derivative Rules</div><div><div>AP EXAM WEIGHTING</div><div>10–12% AB4–7% BC</div><div>CLASS PERIODS</div><div>~13–14 AB~9–10 BC</div></div><div><div>CHA2</div><div>2.1</div><div>Defining Average and Instantaneous Rates of Change at a Point</div></div><div><div>CHA1</div><div>2.2</div><div>Defining the Derivative of a Function and Using Derivative Notation</div></div><div><div>CHA4</div><div>2.3</div><div>Estimating Derivatives of a Function at a Point</div></div><div><div>FUN3</div><div>2.4</div><div>Connecting Differentiability and Continuity: Determining When Derivatives Do and Do Not Exist</div></div><div><div>FUN1</div><div>2.5</div><div>Applying the Power Rule</div></div><div><div>FUN1</div><div>2.6</div><div>Derivative Rules: Constant, Sum, Difference, and Constant Multiple</div></div><div><div>FUN1</div><div>2.7</div><div>Derivatives of $\cos x$, $\sin x$, e^x, and $\ln x$</div></div><div><div>FUN1</div><div>2.8</div><div>The Product Rule</div></div><div><div>FUN1</div><div>2.9</div><div>The Quotient Rule</div></div><div><div>FUN1</div><div>2.10</div><div>Finding the Derivatives of Tangent, Cotangent, Secant, and/or Cosecant Functions</div></div><div><div>Progress Check 2</div><div>Multiple-choice: ~30 questions Free-response: 3 questions (partial)</div></div></div>	<div><div>UNIT 3</div><div>Differentiation: Composite, Implicit, and Inverse Functions</div><div><div>AP EXAM WEIGHTING</div><div>9–13% AB4–7% BC</div><div>CLASS PERIODS</div><div>~10–11 AB~8–9 BC</div></div><div><div>FUN1</div><div>3.1</div><div>The Chain Rule</div></div><div><div>FUN1</div><div>3.2</div><div>Implicit Differentiation</div></div><div><div>FUN3</div><div>3.3</div><div>Differentiating Inverse Functions</div></div><div><div>FUN1</div><div>3.4</div><div>Differentiating Inverse Trigonometric Functions</div></div><div><div>FUN1</div><div>3.5</div><div>Selecting Procedures for Calculating Derivatives</div></div><div><div>FUN1</div><div>3.6</div><div>Calculating Higher-Order Derivatives</div></div><div><div>Progress Check 3</div><div>Multiple-choice: ~15 questions Free-response: 3 questions (partial/full)</div></div></div>	<div><div>UNIT 4</div><div>Contextual Applications of Differentiation</div><div><div>AP EXAM WEIGHTING</div><div>10–15% AB6–9% BC</div><div>CLASS PERIODS</div><div>~10–11 AB~6–7 BC</div></div><div><div>CHA1</div><div>4.1</div><div>Interpreting the Meaning of the Derivative in Context</div></div><div><div>CHA1</div><div>4.2</div><div>Straight-Line Motion: Connecting Position, Velocity, and Acceleration</div></div><div><div>CHA2</div><div>4.3</div><div>Rates of Change in Applied Contexts Other Than Motion</div></div><div><div>CHA1</div><div>4.4</div><div>Introduction to Related Rates</div></div><div><div>CHA3</div><div>4.5</div><div>Solving Related Rates Problems</div></div><div><div>CHA1</div><div>4.6</div><div>Approximating Values of a Function Using Local Linearity and Linearization</div></div><div><div>LIM3</div><div>4.7</div><div>Using L'Hospital's Rule for Determining Limits of Indeterminate Forms</div></div><div><div>Progress Check 4</div><div>Multiple-choice: ~15 questions Free-response: 3 questions</div></div></div>	<div><div>UNIT 5</div><div>Analytical Applications of Differentiation</div><div><div>AP EXAM WEIGHTING</div><div>15–18% AB8–11% BC</div><div>CLASS PERIODS</div><div>~15–16 AB~10–11 BC</div></div><div><div>FUN3</div><div>5.1</div><div>Using the Mean Value Theorem</div></div><div><div>FUN3</div><div>5.2</div><div>Extreme Value Theorem, Global Versus Local Extrema, and Critical Points</div></div><div><div>FUN2</div><div>5.3</div><div>Determining Intervals on Which a Function is Increasing or Decreasing</div></div><div><div>FUN3</div><div>5.4</div><div>Using the First Derivative Test to Determine Relative (Local) Extrema</div></div><div><div>FUN1</div><div>5.5</div><div>Using the Candidates Test to Determine Absolute (Global) Extrema</div></div><div><div>FUN2</div><div>5.6</div><div>Determining Concavity of Functions over Their Domains</div></div><div><div>FUN3</div><div>5.7</div><div>Using the Second Derivative Test to Determine Extrema</div></div><div><div>FUN2</div><div>5.8</div><div>Sketching Graphs of Functions and Their Derivatives</div></div><div><div>FUN2</div><div>5.9</div><div>Connecting a Function, Its First Derivative, and Its Second Derivatives</div></div><div><div>FUN2</div><div>5.10</div><div>Introduction to Optimization Problems</div></div><div><div>FUN3</div><div>5.11</div><div>Solving Optimization Problems</div></div><div><div>FUN1</div><div>5.12</div><div>Exploring Behaviors of Implicit Relations</div></div><div><div>Progress Check 5</div><div>Multiple-choice: ~35 questions Free-response: 3 questions</div></div></div>	<div><div>UNIT 6</div><div>Integration and Accumulation of Change</div><div><div>AP EXAM WEIGHTING</div><div>17–20% AB17–20% BC</div><div>CLASS PERIODS</div><div>~18–20 AB~15–16 BC</div></div><div><div>CHA4</div><div>6.1</div><div>Exploring Accumulations of Change</div></div><div><div>LIM1</div><div>6.2</div><div>Approximating Areas with Riemann Sums</div></div><div><div>LIM2</div><div>6.3</div><div>Riemann Sums, Summation Notation, and Definite Integral Notation</div></div><div><div>FUN1</div><div>6.4</div><div>The Fundamental Theorem of Calculus and Accumulation Functions</div></div><div><div>FUN2</div><div>6.5</div><div>Interpreting the Behavior of Accumulations Functions Involving Area</div></div><div><div>FUN3</div><div>6.6</div><div>Applying Properties of Definite Integrals</div></div><div><div>FUN3</div><div>6.7</div><div>The Fundamental Theorem of Calculus and Definite Integrals</div></div><div><div>FUN4</div><div>6.8</div><div>Finding Antiderivatives and Indefinite Integrals: Basic Rules and Notation</div></div><div><div>FUN1</div><div>6.9</div><div>Integrating Using Substitution</div></div><div><div>FUN1</div><div>6.10</div><div>Integrating Functions Using Long Division and Completing the Square</div></div><div><div>FUN1</div><div>6.11</div><div>Integrating Using Integration by Parts BC ONLY</div></div><div><div>FUN1</div><div>6.12</div><div>Using Linear Partial Fractions BC ONLY</div></div><div><div>LIM1</div><div>6.13</div><div>Evaluating Improper Integrals BC ONLY</div></div><div><div>FUN1</div><div>6.14</div><div>Selecting Techniques of Antidifferentiation</div></div><div><div>Progress Check 6</div><div>Multiple-choice: ~25 questions (AB) ~35 questions (BC) Free-response: 3 questions</div></div></div>	<div><div>UNIT 7</div><div>Differential Equations</div><div><div>AP EXAM WEIGHTING</div><div>6–12% AB6–9% BC</div><div>CLASS PERIODS</div><div>~8–9 AB~9–10 BC</div></div><div><div>FUN2</div><div>7.1</div><div>Modeling Situations with Differential Equations</div></div><div><div>FUN3</div><div>7.2</div><div>Verifying Solutions for Differential Equations</div></div><div><div>FUN2</div><div>7.3</div><div>Sketching Slope Fields</div></div><div><div>FUN4</div><div>7.4</div><div>Reasoning Using Slope Fields</div></div><div><div>FUN1</div><div>7.5</div><div>Approximating Solutions Using Euler's Method BC ONLY</div></div><div><div>FUN1</div><div>7.6</div><div>Finding General Solutions Using Separation of Variables</div></div><div><div>FUN1</div><div>7.7</div><div>Finding Particular Solutions Using Initial Conditions and Separation of Variables</div></div><div><div>FUN3</div><div>7.8</div><div>Exponential Models with Differential Equations</div></div><div><div>FUN3</div><div>7.9</div><div>Logistic Models with Differential Equations BC ONLY</div></div><div><div>Progress Check 7</div><div>Multiple-choice: ~15 questions (AB) ~20 questions (BC) Free-response: 3 questions</div></div></div>	<div><div>UNIT 8</div><div>Applications of Integration</div><div><div>AP EXAM WEIGHTING</div><div>10–15% AB6–9% BC</div><div>CLASS PERIODS</div><div>~19–20 AB~13–14 BC</div></div><div><div>CHA1</div><div>8.1</div><div>Finding the Average Value of a Function on an Interval</div></div><div><div>CHA1</div><div>8.2</div><div>Connecting Position, Velocity, and Acceleration of Functions Using Integrals</div></div><div><div>CHA3</div><div>8.3</div><div>Using Accumulation Functions and Definite Integrals in Applied Contexts</div></div><div><div>CHA4</div><div>8.4</div><div>Finding the Area Between Curves Expressed as Function of x</div></div><div><div>CHA1</div><div>8.5</div><div>Finding the Area Between Curves Expressed as Functions of y</div></div><div><div>CHA2</div><div>8.6</div><div>Finding the Area Between Curves That Intersect at More Than Two Points</div></div><div><div>CHA3</div><div>8.7</div><div>Volumes with Cross Sections: Squares and Rectangles</div></div><div><div>CHA3</div><div>8.8</div><div>Volumes with Cross Sections: Triangles and Semicircles</div></div><div><div>CHA3</div><div>8.9</div><div>Volume with Disc Method: Revolving Around x- or y-Axis</div></div><div><div>CHA2</div><div>8.10</div><div>Volume with Disc Method: Revolving Around Other Axes</div></div><div><div>CHA4</div><div>8.11</div><div>Volume with Washer Method: Revolving Around the x- or y-Axis</div></div><div><div>CHA2</div><div>8.12</div><div>Volume with Washer Method: Revolving Around Other Axes</div></div><div><div>CHA3</div><div>8.13</div><div>The Arc Length of a Smooth, Planar Curve and Distance Traveled BC ONLY</div></div><div><div>Progress Check 8</div><div>Multiple-choice: ~30 questions Free-response: 3 questions</div></div></div>	<div><div>UNIT 9</div><div>Parametric Equations, Polar Coordinates, and Vector-Valued Functions BC ONLY</div><div><div>AP EXAM WEIGHTING</div><div>N/A AB11–12% BC</div><div>CLASS PERIODS</div><div>N/A AB~10–11 BC</div></div><div><div>CHA2</div><div>9.1</div><div>Defining and Differentiating Parametric Equations</div></div><div><div>CHA1</div><div>9.2</div><div>Second Derivatives of Parametric Equations</div></div><div><div>CHA1</div><div>9.3</div><div>Finding Arc Lengths of Curves Given by Parametric Equations</div></div><div><div>CHA1</div><div>9.4</div><div>Defining and Differentiating Vector-Valued Functions</div></div><div><div>FUN1</div><div>9.5</div><div>Integrating Vector-Valued Functions</div></div><div><div>FUN1</div><div>9.6</div><div>Solving Motion Problems Using Parametric and Vector-Valued Functions</div></div><div><div>FUN2</div><div>9.7</div><div>Defining Polar Coordinates and Differentiating in Polar Form</div></div><div><div>CHA3</div><div>9.8</div><div>Find the Area of a Polar Region or the Area Bounded by a Single Polar Curve</div></div><div><div>CHA3</div><div>9.9</div><div>Finding the Area of the Region Bounded by Two Polar Curves</div></div><div><div>Progress Check 9</div><div>Multiple-choice: ~25 questions Free-response: 3 questions</div></div></div>	<div><div>UNIT 10</div><div>Infinite Sequences and Series BC ONLY</div><div><div>AP EXAM WEIGHTING</div><div>N/A AB17–18% BC</div><div>CLASS PERIODS</div><div>N/A AB~17–18 BC</div></div><div><div>LIM3</div><div>10.1</div><div>Defining Convergent and Divergent Infinite Series</div></div><div><div>LIM3</div><div>10.2</div><div>Working with Geometric Series</div></div><div><div>LIM3</div><div>10.3</div><div>The nth Term Test for Divergence</div></div><div><div>LIM3</div><div>10.4</div><div>Integral Test for Convergence</div></div><div><div>LIM3</div><div>10.5</div><div>Harmonic Series and p-Series</div></div><div><div>LIM3</div><div>10.6</div><div>Comparison Tests for Convergence</div></div><div><div>LIM3</div><div>10.7</div><div>Alternating Series Test for Convergence</div></div><div><div>LIM3</div><div>10.8</div><div>Ratio Test for Convergence</div></div><div><div>LIM3</div><div>10.9</div><div>Determining Absolute or Conditional Convergence</div></div><div><div>LIM1</div><div>10.10</div><div>Alternating Series Error Bound</div></div><div><div>LIM3</div><div>10.11</div><div>Finding Taylor Polynomial Approximation of Function</div></div><div><div>LIM1</div><div>10.12</div><div>Lagrange Error Bound</div></div><div><div>LIM2</div><div>10.13</div><div>Radius and Interval of Convergence of Power Series</div></div><div><div>LIM2</div><div>10.14</div><div>Finding Taylor or Maclaurin Series for a Function</div></div><div><div>LIM3</div><div>10.15</div><div>Representing Functions as Power Series</div></div><div><div>Progress Check 10</div><div>Multiple-choice: ~45 questions Free-response: 3 questions</div></div></div>
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NOTE: Partial versions of the free-response questions are provided to prepare students for more complex, full questions that they will encounter on the AP Exam.