

	AP Calculus BC									
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10 – Infinite
	Unit 1 – Limits and Continuity	Unit 2 – Differentiation: Definition and Basic Derivative Rules	Unit 3 – Differentiation: Composite, Implicit, and Inverse Functions	Unit 4 – Contextual Applications of Differentiation	Unit 5 – Analytical Applications of Differentiation	Unit 6 – Integration and Accumulation of Change	Unit 7 – Differential Equations	Unit 8 – Applications of Integration	Unit 9 – Parametric Equations, Polar Coordinates, and Vector-Valued Functions (BC)	Unit 10 – Infinite Sequences and Series (BC)
	<i>Approximately 13–14</i>	<i>Approximately 9–10</i>	<i>Approximately 8–9</i>	<i>Approximately 6–7</i>	<i>Approximately 10–11</i>	<i>Approximately 15–16</i>	<i>Approximately 9–10</i>	<i>Approximately 13–14</i>	<i>Approximately 10–11</i>	<i>Approximately 17–18</i>
Objective(s) / Essential Question(s)	<i>How can the idea of a limit be used to describe instantaneous behavior and to determine whether a function is continuous at a point or over an interval?</i>	<i>What does it mean for a function to be differentiable, and how are the foundational rules of differentiation derived and applied?</i>	<i>How do the Chain Rule and implicit differentiation extend our ability to find derivatives of composite, inverse, and higher-order functions?</i>	<i>How can derivatives be interpreted and applied to model rates of change, related rates, linear approximation, and indeterminate limits in real-world contexts?</i>	<i>How do the Mean Value Theorem, first and second derivative tests, and optimization techniques allow us to fully analyze and sketch the behavior of a function?</i>	<i>How does the definite integral formalize the accumulation of change, and how does the Fundamental Theorem of Calculus connect differentiation and integration?</i>	<i>How can differential equations be modeled, verified, and solved—graphically with slope fields and analytically with separation of variables—to represent exponential and logistic growth?</i>	<i>How can definite integrals be used to find average value, net change, areas between curves, volumes of solids, and the arc length of a curve?</i>	<i>How are derivatives and integrals defined, calculated, and applied for parametric equations, vector-valued functions, and polar curves?</i>	<i>How can convergence tests determine whether an infinite series converges or diverges, and how can Taylor and Maclaurin series be used to represent and approximate functions?</i>
INSTRUCTIONAL MATERIALS	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts	Graphing calculator (TI-84/TI-89 or equivalent), pencil, paper, chromebook, handouts
MAJOR TASKS, ASSESSMENTS, and FIELD TRIPS	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 1 (~45 MC, 3 FRQ–partial) & Unit Test (AP Exam weighting: 4–7%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 2 (~30 MC, 3 FRQ–partial) & Unit Test (AP Exam weighting: 4–7%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 3 (~15 MC, 3 FRQ–partial/full) & Unit Test (AP Exam weighting: 4–7%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 4 (~15 MC, 3 FRQ) & Unit Test (AP Exam weighting: 6–9%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 5 (~35 MC, 3 FRQ) & Unit Test (AP Exam weighting: 8–11%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 6 (MC & 3 FRQ) & Unit Test (AP Exam weighting: 17–20%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 7 (MC & 3 FRQ) & Unit Test (AP Exam weighting: 6–9%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 8 (~30 MC, 3 FRQ) & Unit Test (AP Exam weighting: 6–9%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 9 (~25 MC, 3 FRQ) & Unit Test (AP Exam weighting: 11–12%)	Mid-Chapter Quiz and End of Unit Tests Personal Progress Check 10 (~45 MC, 3 FRQ) & Unit Test (AP Exam weighting: 17–18%)
STANDARDS ADDRESSED TN State Stds.	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): CHA 1.1 Introducing Calculus: Can Change Occur at an Instant?; LIM 1.2–1.9 Defining Limits, Using Limit Notation, and Determining Limit Values Graphically, Numerically, and Algebraically (incl. the Squeeze Theorem); LIM 1.10–1.13 Types of Discontinuities, Defining and Confirming Continuity, and Removing Discontinuities; LIM 1.14–1.15 Infinite Limits, Limits at Infinity, and Asymptotes; FUN 1.16 Working with the Intermediate Value Theorem (IVT) ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): CHA 2.1–2.3 Defining Average and Instantaneous Rates of Change, the Derivative of a Function, and Estimating Derivatives at a Point; FUN 2.4 Connecting Differentiability and Continuity; FUN 2.5–2.6 The Power Rule and Derivative Rules for Sums, Differences, and Constant Multiples; FUN 2.7 Derivatives of $\cos x$, $\sin x$, e^x , and $\ln x$; FUN 2.8–2.9 The Product Rule and the Quotient Rule; FUN 2.10 Derivatives of Tangent, Cotangent, Secant, and Cosecant ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): FUN 3.1 The Chain Rule; FUN 3.2 Implicit Differentiation; FUN 3.3–3.4 Differentiating Inverse Functions and Inverse Trigonometric Functions; FUN 3.5 Selecting Procedures for Calculating Derivatives; FUN 3.6 Calculating Higher-Order Derivatives ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): CHA 4.1 Interpreting the Meaning of the Derivative in Context; CHA 4.2 Straight-Line Motion: Position, Velocity, and Acceleration; CHA 4.3 Rates of Change in Applied Contexts Other Than Motion; CHA 4.4–4.5 Related Rates; CHA 4.6 Local Linearity and Linearization; LIM 4.7 Using L'Hospital's Rule for Indeterminate Forms ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): FUN 5.1 Using the Mean Value Theorem; FUN 5.2 Extreme Value Theorem: Global vs. Local Extrema, and Critical Points; FUN 5.3–5.5 Increasing/Decreasing Intervals, First Derivative Test, and Candidates Test; FUN 5.6–5.7 Concavity and the Second Derivative Test; FUN 5.8–5.9 Sketching and Connecting Graphs of Functions and Derivatives; FUN 5.10–5.11 Introduction to and Solving Optimization Problems; FUN 5.12 Exploring Behaviors of Implicit Relations ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): CHA 6.1 Exploring Accumulations of Change; LIM 6.2–6.3 Approximating Areas with Riemann Sums and Definite Integral Notation; FUN 6.4–6.7 The Fundamental Theorem of Calculus, Accumulation Functions, and Properties of Definite Integrals; FUN 6.8–6.10 Antiderivatives and Indefinite Integrals: Basic Rules, Substitution, Long Division, and Completing the Square; FUN 6.11 Integration by Parts (BC); FUN 6.12 Linear Partial Fractions (BC); LIM 6.13 Evaluating Improper Integrals (BC); FUN 6.14 Selecting Techniques for Antidifferentiation ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): FUN 7.1–7.2 Modeling and Verifying Solutions for Differential Equations; FUN 7.3–7.4 Sketching and Reasoning Using Slope Fields; FUN 7.5 Approximating Solutions Using Euler's Method (BC); FUN 7.6–7.7 Solving Differential Equations Using Separation of Variables; FUN 7.8 Exponential Models with Differential Equations; FUN 7.9 Logistic Models with Differential Equations (BC) ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): CHA 8.1 Average Value of a Function; CHA 8.2 Connecting Position, Velocity, and Acceleration Using Integrals; CHA 8.3 Accumulation Functions and Definite Integrals in Applied Contexts; CHA 8.4–8.6 Area Between Curves (Functions of x and y , Multiple Intersections); CHA 8.7–8.8 Volumes with Cross Sections: Squares, Rectangles, Triangles, and Semicircles; CHA 8.9–8.10 Volume with the Disc Method; CHA 8.11–8.12 Volume with the Washer Method; CHA 8.13 Arc Length of a Smooth, Planar Curve (BC) ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): CHA 9.1–9.2 Defining and Differentiating Parametric Equations; Second Derivatives; CHA 9.3 Arc Length of Parametric Curves; CHA 9.4 Defining and Differentiating Vector-Valued Functions; FUN 9.5–9.6 Integrating Vector-Valued Functions and Solving Motion Problems; FUN 9.7 Defining Polar Coordinates and Differentiating in Polar Form; CHA 9.8–9.9 Area of a Single Polar Region and Area Between Two Polar Curves ACT Stds.: N/A – content exceeds ACT math scope	TN State Stds.: N/A – course aligned to the College Board AP Calculus BC Course and Exam Description (CED) AP Stds. (CED Learning Objectives): LIM 10.1–10.2 Defining Convergent/Divergent Series and Geometric Series; LIM 10.3–10.8 Divergence, Integral, p-Series, Comparison, Alternating Series, and Ratio Tests for Convergence; LIM 10.9–10.10 Absolute/Conditional Convergence and Alternating Series Error Bound; LIM 10.11–10.12 Taylor Polynomial Approximations and Lagrange Error Bound; LIM 10.13 Radius and Interval of Convergence of Power Series; LIM 10.14–10.15 Taylor/Maclaurin Series and Representing Functions as Power Series ACT Stds.: N/A – content exceeds ACT math scope

*Parents may access instructional materials by becoming a Canvas Observer.

Per Johnson City Board of Education Policy 4.400, upon request, parents/guardians shall have the ability to inspect the following items: instructional materials, teaching materials, teaching aids,

handouts, and tests that are developed by and graded by their child's teacher. The Superintendent of Schools shall develop procedures for the inspection of materials and distribute these procedures to each

principal.