

**Unit 1: Introduction to Calculus**

U1O1: Find average rate of change of a function.

U1O2: Sketch the graph of the derivative of a function.

U1O3: Estimate area under a curve with Riemann sums.

U1O4: Estimate area under a curve with trapezoids.

**Unit 2: Derivative Rules**

U2O1: Differentiate with power rule.

U2O2: Differentiate with product rule.

U2O3: Differentiate with quotient rule.

U2O4: Differentiate with chain rule.

U2O5: Differentiate with trig rules.

U2O6: Differentiate with inverse trig rules.

U2O7: Differentiate with natural log rule.

U2O8: Differentiate with e rule.

U2O9: Differentiate with inverse function rule.

U2O10: Differentiate implicitly.

\*U2O10<sup>+</sup>: Differentiate parametrically defined functions.

\*U2O10<sup>++</sup>: Differentiate polar functions.

**Integration Rules**

U3O1: Integrate basic functions.

U3O2: Integrate using u-substitution.

\*U3O3: Integrate by parts.

\*U3O4: Integrate using partial fractions.

**Unit 4: Curve Sketching**

U4O1: Determine when a function is increasing/decreasing.

U4O2: Determine the concavity of a function.

U4O3: Find relative extreme values of a function.

U4O4: Find global extreme values of a function.

U4O5: Use the 2<sup>nd</sup> Fundamental Theorem of Calculus.

**Unit 5: Limits**

U5O1: Find the limit of a function graphically/numerically.

U5O2: Find the limit of a function algebraically.

U5O3: Use limits to describe asymptotes of a function.

U5O4: Use limits to define a derivative.

\*U5O5: Evaluate improper integrals.

**Unit 6: Continuity and Differentiability**

U6O1: Use the definition of continuity at a point.

U6O2: Use the Intermediate Value Theorem to solve problems.

U6O3: Use the definition of differentiable at a point.

U6O4: Use the Mean Value Theorem to solve problems.

\*Indicates a BC only Topic

+Indicates Applying Concepts to Parametric Functions

++ Indicates Applying Concepts to Polar Functions

**Unit 7: Rates of Change**

U701: Use implicit differentiation to solve related rates problems.

U702: Use integration techniques to solve related rates problems.

U703: Find the average value of a function.

**Unit 8: Particle Motion**

U801: Integrate to find position of a particle.

U802: Differentiate or integrate to find velocity of a particle.

U803: Differentiate to find acceleration of a particle.

U804: Use velocity to describe the direction of motion.

U805: Determine if a particle is speeding up or slowing down.

U806: Find the total distance traveled by a particle.

\*U801<sup>+</sup>: Integrate parametric functions to find position of a particle.

\*U802<sup>+</sup>: Differentiate or integrate parametric functions to find velocity of a particle.

\*U803<sup>+</sup>: Differentiate parametric functions to find acceleration of a particle.

\*U804<sup>+</sup>: Use velocity defined by parametric functions to describe the direction of motion.

**Unit 9: Differential Equations**

U901: Use slope fields to visualize a solution curve.

U902: Model exponential growth with differential equations.

\*U903: Model logistic growth with differential equations.

U904: Use separation of variables to solve differential equations.

\*U905: Use Euler's method to approximate the solution to a differential equation.

U906: Use linearization to approximate a function value.

**Unit 10: Area and Volume**

U1001: Find area between curves.

\*U1001<sup>++</sup>: Find area between polar curves.

U1002: Find the volume of a solid of rotation.

U1003: Find the volume of a solid of known cross section.

\*U1004: Find the length of an arc.

**\*Unit 11: Sequences and Series**

U1101: Find the sum of an infinite geometric series.

U1102: Determine the convergence of a series.

U1103: Construct a Taylor series for a function.

U1104: Approximate a function with a Taylor series.

U1105: Determine the Lagrange error for a Taylor series approximation.

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