

Mathematics Scope and Sequence
Vashon Island High School: Advanced Placement Calculus, AB

First Trimester	Second Trimester	Third Trimester
<p>Prerequisites: The Cartesian plane and functions (Ch. 1)</p> <ul style="list-style-type: none"> • Real numbers and the real line • The Cartesian plane • Graphs of equations • Lines in the plane • Functions • Review of trigonometric functions <p>Limits and their properties(Ch. 2)</p> <ul style="list-style-type: none"> • An introduction to limits • Properties • Techniques for evaluating limits • Continuity • One-sided limits • Infinite limits <p>Differentiation (Ch. 3)</p> <ul style="list-style-type: none"> • Derivative and the tangent line problem • Basic differentiation rules and rates of change • Products and quotient rules, higher order derivatives • The chain rule • Implicit differentiation • Related rates 	<p>Applications of differentiation (Ch. 4)</p> <ul style="list-style-type: none"> • Extrema on an interval • Rolle’s theorem and the mean value theorem • Increasing and decreasing functions, first derivative test • Concavity, second derivative test • Limits at infinity • Curve sketching • Optimization problems • Newton’s method • Differentials <p>Integration (Ch. 5)</p> <ul style="list-style-type: none"> • Antiderivatives and indefinite integration • Area • Reimann sums and definite integration • Fundamental theorem of calculus • Integration by substitution • Numerical integration <p>Logarithmic, exponential, and other transcendental functions</p> <ul style="list-style-type: none"> • The natural logarithmic function and differentiation • The natural logarithmic function and integration • Inverse functions • Exponential functions: Differentiation and integration • Bases other than e and applications • Differential equations: growth and decay • Inverse trigonometric functions and differentiation • Inverse trigonometric functions: Integration and completing the square 	<p>Applications of integration (Ch. 7)</p> <ul style="list-style-type: none"> • Area of a region between two curves • Volume: Disc method • Volume: Shell method • Arc length and surfaces of revolution <p>AP Test Review</p> <ul style="list-style-type: none"> • Functions • Conic sections • Limits • Rules for differentiation • Applications of the derivative • Rules for integration • Applications of integration <p>Integration techniques, L’Hopital’s Rule, and improper integrals (Ch. 8)</p> <ul style="list-style-type: none"> • Basic integration rules • Integration by parts • Trigonometric integrals • Trigonometric substitution • Partial fractions • Indeterminate forms and L’Hopital’s Rule • Improper integrals <p>Additional applications and/or projects</p> <ul style="list-style-type: none"> • Work • Fluid pressure