

<b>DEPARTMENT: MATHEMATICS</b>	<b>COURSE TITLE: CALCULUS HONORS</b> <b>COURSE NUMBER: 340</b>
<b>GRADE(S): 9-12</b>	<b>PRE-REQUISITES (IF ANY): PRE-CALCULUS TRIG AND ANALYSIS</b>

<b>UNIT</b>	<b>LENGTH IN WEEKS</b>	<b>CONTENT</b>	<b>SKILLS</b>	<b>METHODS OF ASSESSMENT</b>	<b>FRAMEWORK STRAND(S) &amp; STANDARD(S)</b>
Limits & Continuity of Functions	4	<ul style="list-style-type: none"> <li>• Introduction of Limits</li> <li>• Formal definition of limits using epsilon-delta approach</li> <li>• Theorems of limits and one-sided limits</li> <li>• Continuous functions</li> </ul>	<ul style="list-style-type: none"> <li>• Estimate limits of functions by looking at graphs</li> <li>• Find limits of functions at a given point algebraically</li> <li>• Estimate limits by approaching value from both sides</li> <li>• Find the maximum value for delta using a given value for epsilon in the definition of limits</li> <li>• Use theorems of limits to find the limit of a function</li> <li>• Decide if a function is discontinuous by indicating which part of the definition of a continuous function fails</li> </ul>	<ul style="list-style-type: none"> <li>• Test</li> <li>• Quiz</li> <li>• Homework</li> <li>• Class work</li> <li>• Group Work</li> <li>• Demonstrations</li> </ul>	
Derivatives	4	<ul style="list-style-type: none"> <li>• As velocity</li> <li>• As slope of tangent lines</li> <li>• Definition</li> <li>• Rules for finding derivatives</li> <li>• Increments and Differentials</li> <li>• Chain Rule</li> <li>• Implicit differentiation</li> <li>• Higher order derivatives</li> </ul>	<ul style="list-style-type: none"> <li>• Find average and instantaneous velocity of position functions</li> <li>• Find the equation of the tangent line at a given point</li> <li>• Find the equation of horizontal tangent lines of quadratic or cubic functions</li> <li>• Sketch the derivatives function of the graph of a function</li> <li>• Use the limit definition of the derivative to find derivatives of given functions</li> <li>• find the derivative of a given polynomial function, rational function and functions with rational powers</li> <li>• Find the derivative of the sum, difference, product, quotient and composition of a given polynomial function using the chain rule where appropriate</li> </ul>	<ul style="list-style-type: none"> <li>• Test</li> <li>• Quiz</li> <li>• Homework</li> <li>• Class work</li> <li>• Group Work</li> <li>• Demonstrations</li> </ul>	
Applications of Derivatives	4	<ul style="list-style-type: none"> <li>• Local extrema of functions</li> <li>• Rolle's theorem and Mean Value theorem</li> <li>• First and Second derivative tests</li> <li>• Horizontal and vertical</li> </ul>	<ul style="list-style-type: none"> <li>• Locate maximum, minimum points and points of inflection for a given function for a given function</li> <li>• Show Rolle's theorem is true for specific intervals of functions by locating where the derivative is zero</li> <li>• Show the mean value theorem is true for</li> </ul>	<ul style="list-style-type: none"> <li>• Test</li> <li>• Quiz</li> <li>• Homework</li> <li>• Class work</li> <li>• Group Work</li> <li>• Demonstrations</li> </ul>	

		asymptotes	specific intervals of a function by locating one or more points where the derivative is equal to the slope of the line through the endpoints of the interval		
Definite Integrals	6	<ul style="list-style-type: none"> <li>• Area under a curve</li> <li>• Definition of definite integral</li> <li>• Properties of the definite integral</li> <li>• Mean Value theorem</li> <li>• Fundamental Theorem of Calculus</li> <li>• Indefinite Integrals</li> <li>• Numerical Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Find area by estimating with rectangular areas.</li> <li>• Use Riemann Sums to define integrals</li> <li>• Find areas under curves by using the definition</li> <li>• Find areas under curves by using the properties of definite integral</li> <li>• Find values that satisfy the Mean Value theorem</li> <li>• Use Fundamental Theorem of Calculus to find definite integrals.</li> <li>• Evaluating indefinite integrals.</li> <li>• Using Trapezoidal Rule and Simpson's Rule to estimate area under a curve.</li> </ul>	<ul style="list-style-type: none"> <li>• Test</li> <li>• Quiz</li> <li>• Homework</li> <li>• Class work</li> <li>• Group Work</li> <li>• Demonstrations</li> </ul>	
Application of Definite Integral	6	<ul style="list-style-type: none"> <li>• Area</li> <li>• Solids of revolution</li> <li>• Volumes</li> <li>• Work</li> <li>• Arc length</li> </ul>	<ul style="list-style-type: none"> <li>• Finding areas between two graphs</li> <li>• Finding volumes of solids of revolution</li> <li>• Finding volumes using cylindrical shells</li> <li>• Finding volumes using the slicing method.</li> <li>• Using integrals to solve work problems.</li> <li>• Using integrals to find Arc lengths</li> </ul>	<ul style="list-style-type: none"> <li>• Test</li> <li>• Quiz</li> <li>• Homework</li> <li>• Class work</li> <li>• Group Work</li> <li>• Demonstrations</li> </ul>	