

Planned Course of Study

Calculus

Grade 12

Mathematics Department

Salisbury Township School District

1140 Salisbury Road

Allentown, PA 18103

**Course name *Calculus*
Grade 12
Full Year**

Learning Objectives/ Content	Teaching/Learning Activities	Evaluation Criteria	State Standard
<p>All students will</p> <p>OBJECTIVE 1</p> <p>To review the topics of lines and their slopes .</p>	<p>Given a point and a slope. Two points, or a point and a line perpendicular to a line, the student will have to find the equation of a line.</p> <p>Students will also have to look at graphs and determine slopes and intercepts of the given lines.</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p>2.1.11 A</p> <p>2.2.11 A</p> <p>2.4.11 E</p> <p>2.5.11 A, B, C</p> <p>2.8.11 A, B, D, E, F, G, H, J, K, L, M, N, Q, S</p>
Resources/Materials			
Additional Resources/Inter-disciplinary Relationships			

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<p>All students will</p> <p>OBJECTIVE 2</p> <p>To become familiar with the use of technologies as they can be used in calculus.</p>	<p>The students will use graphing calculators and learn how to graph and manipulate graphs on a TI calculator.</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p style="text-align: center;">2.1.11 A</p> <p style="text-align: center;">2.2.11 F</p>
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<p>All students will</p> <p>OBJECTIVE 3</p> <p>To be able to compose new functions from old. To understand the effect on an equation of stretches and compressions, even and oddness of a function, and a symmetry of functions.</p>	<p>Students will be able to compose new functions from old by using $f \circ g$ and $g \circ f$, as well as $F+g$, $f-g$, $f \cdot g$, and f/g.</p> <p>Students will also understand domain and range as they apply to composition of functions.</p> <p>Students will be able to identify functions as odd or even and also find all lines of symmetry</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p style="text-align: center;">2.1.1 A</p> <p style="text-align: center;">2.2.11 A</p> <p style="text-align: center;">2.5.11 B, C</p> <p style="text-align: center;">2.8.11 D, E, F, G, N, O, Q</p>
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<p>All students will</p> <p>OBJECTIVE 4</p> <p>To be able to write parametric equations and transform equations from rectangular to parametric.</p>	<p>Students will be given equations in parametric form and ask to change them to rectangular and the other way around.</p> <p>Students will be able to graph equations in parametric form both on the calculator and on paper.</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p>2.1.11 A</p> <p>2,2,11 F</p>
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<p>All students will</p> <p>OBJECTIVE 5</p> <p>To simplify limits both intuitively and computationally.</p>	<p>Students will be able to look at graphs and determine both one and two sided limits as well as limits at infinities.</p> <p>Students will be able to use the rules of limits to compute limits of regular functions as well as piecewise functions and absolute values.</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p>2.1.11 A</p>
Resources/Materials			
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<p>All students will</p> <p>OBJECTIVE 6</p> <p>To understand continuity of functions.</p> <p>OBJECTIVE 7</p> <p>To compute the derivative of functions.</p>	<p>Students will be able to describe a function as continuous or not and also be able to find all points of discontinuity if they exist.</p> <p>Given a function, students will be able to find the derivative using power rule, product rule, quotient rule, chain rule, and the rules for derivatives of trigonometric functions.</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p>2.1.11 A</p> <p>2.5.11 B, C, D</p> <p>2.8.11 E, H, K, O, S</p> <p>2.10.11 A</p> <p>2.8.11 A</p>
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<p>All students will</p> <p>OBJECTIVE 8</p> <p>To find the derivatives of both logarithmic and exponential functions.</p> <p>OBJECTIVE 9</p> <p>To study related rate problems.</p>	<p>Students will learn the rules and properties of derivatives of both logarithmic and exponential functions.</p> <p>Students will be able to solve word problems involving finding the rate at which some quantity is changing by relating it to other quantities whose rates of change are known.</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p>2.1.11 A</p> <p>2.5.11 A, B, C, D</p> <p>2.8.11 D, E, G, H, K, N, O, Q, R, S</p>
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<p>All students will</p> <p>OBJECTIVE 10</p> <p>To understand the shape of the graph of a function by working with its equation.</p> <p>OBJECTIVE 11</p> <p>To find the highest and lowest values of a function over a given interval.</p>	<p>Students will be able to find the concavity, points of inflection, areas of increasing and decreasing and critical points by using both the first and second derivative tests.</p> <p>Students will apply the principal of critical points to equations and word problems and determine the absolute maximum and minimum of a function over a given interval.</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p style="text-align: center;">2.8.11 A, B, D, E, G, H, N, O, Q, R, S, T</p> <p style="text-align: center;">2.1.11 A</p> <p style="text-align: center;">2.11.11 A, B</p>
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<p>All students will</p> <p>OBJECTIVE 12</p> <p>To find the integral of given functions.</p> <p>OBJECTIVE 13</p> <p>To find the area under a curve or between two curves.</p>	<p>Students will find the integral of a given function by using the definition of integration and also by using the power rule.</p> <p>Students will find the area under the curve by using definite integrals</p>	<ul style="list-style-type: none"> • Homework, classroom discussions, activities, quizzes, and tests 	<p>2.1.11 A</p> <p>2.11.11 D, E</p>
Resources/Materials			
Additional Resources/Inter-disciplinary Relationships			