Calculus
Program of Studies Description

*40441X CALCULUS

(Grade 11,12) (1.0 Credit)

(Prerequisite: CP or Honors Trigonometry/Algebra 3, and teacher recommendation)

This calculus course is for advanced students in mathematics. Students will review the basic concepts relating to functions and graphs as needed throughout the course and will learn rules for differentiation, antidifferentiation, calculating limits, and determining continuity. Individually or in small groups, students will use appropriate technology to analyze and solve problems involving limits, continuity, optimization and displacement, velocity and acceleration. Achievement will be demonstrated through completion of graphing calculator activities, tests, quizzes, and homework assignments requiring problem-solving skills. Students will take the Calculus final exam at the end of the course.

Revised: April 2026

Calculus

Syllabus

Whitehall-Coplay School District Syllabus

Course Title: Calculus **Grade: 10-12**

DESCRIPTION OF COURSE:

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REQUIRED TOPICS OF STUDY	SUGGESTED INSTRUCTIONAL TIME	STANDARDS/ELIGIBLE CONTENT
Pre-Requisites - Exponential and Logarithmic Review	15 class periods	CC.2.2.HS.C.1, CC.2.2.HS.C.2, CC.2.2.HS.C.3, CC.2.2.HS.C.5, CC.2.2.HS.D.2
Limits	20 class periods	1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16
Derivatives	30 class periods	2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10 3.1, 3.2, 3.3, 3.4, 3.5, 3.6 4.1, 4.2, 4.6, 5.9
*** Definite and Indefinite Integrals	5 class periods	6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.14, 8.2
** Eligible content taken from mathematical practices from College Board AP Calculus **		

*** If time permits definite integrals will be introduced ***

RESOURCES: Foerster, Paul. Calculus: Concepts and Applications. Berkeley: Key Curriculum Press, 2005 2nd Edition.
Graphing Calculator: TI-84 Plus or TI-84 CE(color edition.)

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WHITEHALL-COPLAY SCHOOL DISTRICT
CURRICULUM MAP

COURSE TITLE: ___CALCULUS____ **BUILDING: ___HIGH SCHOOL**

GRADE LEVEL: ___10/11/12_____ **SUBJECT: MATHEMATICS**

MONTH/	TOPIC	ASSESSMENT ANCHOR	MATERIALS
Review of Logarithms	***To simplify expressions using rational and irrational exponents.** ***To solve exponential equations by using properties of exponents.** ***To show how exponential and logarithmic functions are related.**	**M11.A.1.1.1** **M11.A.1.1.4** **M11.A.2.2.1** **M11.A.2.2.2**	**Handouts, Smartboard lessons, lecture notes, graphing calculators, TI-84 CE**

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<u>Introduction to Calculus</u>	***To apply the properties of logarithms to simplify expressions.** ***To apply the properties of natural logarithms and solve exponential equations by using natural logarithms.**	**M11.D3.1.1** **M11.D.3.2.1** **M11.D.2.2.3**	

<u>Properties of Limits (Chapter 2)</u>	***To demonstrate the definition of limit by finding limits graphically and using tables** ***To use the limit theorems and properties of limits to prove limits of various functions.** ***To use the definition of continuity to prove whether a function is continuous or not at a given value of x.** ***To find limits of functions that involve x approaching infinity and/or infinite limits.** ***To apply the Intermediate Value Theorem to show a**	**M11.D.4.1.1** **M11.D.2.2.3**	**Handouts, Smartboard lessons, lecture notes, graphing calculators, TI-84 CE**

<u>Derivatives (Chapter 3)</u>	**value c exists in [a,b] where f(c) = y.** ***To use the definition of derivative at a point to find a derivative value. To demonstrate the concept using a graph.** ***To calculate the derivative at a point by using numeric methods. To graph the derivative function by using calculator methods.** ***To use the definition of derivative to find $f'(x)$. To apply the power rule and properties of differentiation to find the derivative of a function**	**M11.D3.1.1** **M11.D.3.2.1** **M11.D.2.2.3** **M11.D.4.1.1**	

	***To find an equation for velocity and acceleration of a moving object given the equation for its displacement.** ***To find the derivative of the sine and cosine functions by using the calculator.** ***To find the derivative of a composite function by using the chain rule.** ***To prove the derivative and sine and cosine by using the squeeze theorem and the definition of derivative. To find the derivatives of sinusoidal functions.** ***To calculate algebraically the derivative of an**		

	exponential and/or logarithmic function.		
<u>More Derivatives (Chapter 4)</u>	***To apply the product rule to find the derivative of a product.** ***To apply the quotient rule to find the derivative of a quotient.** ***To find the derivatives of the six trigonometric functions by applying the quotient rule and**	**M11.D3.1.1** **M11.D.3.2.1** **M11.D.2.2.3**	**Handouts, smartboard lessons, lecture notes, graphing calculators, TI-navigator system.**

Integrals (Chapter 5)	**trigonometric identities.** ***To find derivatives of the six inverse trig functions by using implicit differentiation.** ***To apply the definitions of differentiability and continuity to explain properties of functions** ***To find derivatives of parametric equations by applying the parametric chain rule.** ***To find the derivatives of implicit relations by using implicit differentiation.** *** To be able to solve related rate problems.**		

	***To find the equation for the linear function that best fits the function at a point. To find values for differentials dx and dy.** ***To apply the definition of indefinite integral and properties to find the indefinite integral of a function.** ***To define different types of Reimann Sums and use them to find the value of a definite integral.**	**M11.D.4.1.1** **M11.D.3.2.2**	

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