



**KENOSHA UNIFIED SCHOOL DISTRICT NO. 1  
CURRICULUM AND INSTRUCTIONAL SERVICES**

**HIGH SCHOOL COURSE SYLLABUS**

**MATHEMATICS DEPARTMENT**

**Pre-Calculus Honors (352021 & 352022)**

**Number of Credits: 1**

**Prerequisites**

Successful completion of Geometry-Honors (322021 & 322022) and Algebra 2/Trig-Honors (332021 & 332022) or Math Analysis (351011 & 351012)

**Course Description**

This course is designed to prepare the student for the rigorous study of AP Calculus. Pre-Calculus includes the study of the following variety of functions and their graphs: linear, absolute value, square root, greatest integer, quadratic, cubic, higher order polynomial, rational, exponential, logarithmic, trigonometric, inverse sine, inverse cosine, and inverse tangent. Other topics included in this course are analytic trigonometry, inverses, sequences, series, limits, derivatives, and graphing.

**Relevance**

This course sharpens algebraic manipulation skills and provides the skills necessary to analyze a variety of functions mathematically. Pre-Calculus will allow the equation of a function to become visual graphically and the graph of a function to be quantified symbolically. In addition to being preparation for a variety of careers, Pre-Calculus will prepare students for the challenges of AP Calculus.

**Course Standards**

- |                          |                |                               |
|--------------------------|----------------|-------------------------------|
| A. Mathematica processes | C. Geometry    | E. Statistics and probability |
| B. Number relationships  | D. Measurement | F. Algebraic relationships    |

Most essential benchmarks may be viewed at: [www.kusd.edu](http://www.kusd.edu).

**Lifelong Learning Standards**

- |                        |                          |                        |
|------------------------|--------------------------|------------------------|
| • Knowledgeable person | • Effective communicator | • Quality producer     |
| • Complex thinker      | • Self-directed learner  | • Contributing citizen |

Lifelong learning benchmarks may be viewed at: [www.kusd.edu](http://www.kusd.edu).

**Course Outline**

Semester 1:

- **Functions and Their Graphs:** Students will find and use the slope of a line to write and graph linear equations, evaluate functions and find their domains, analyze graphs of functions, identify and graph transformations of functions, find arithmetic combinations and compositions of functions, and find inverse functions graphically and algebraically.
- **Polynomial and Rational Functions:** Students will sketch and analyze graphs of quadratic and polynomial functions; use long division and synthetic division to divide polynomials by other

polynomials; determine the numbers of rational and real zeros of polynomial functions, and find the zeros; perform operations with complex numbers; determine the domains, find the asymptotes, and sketch the graphs of rational functions.

- Exponential and Logarithmic Functions: Students will recognize, evaluate and graph exponential and logarithmic functions; rewrite logarithmic functions with different bases; use properties of logarithms to evaluate, rewrite, expand, or condense logarithmic expressions; solve exponential and logarithmic equations; use exponential growth models, exponential decay models, Gaussian models, logistic models, and logarithmic models to solve real-life problems
- Trigonometric Functions: Students will describe and angle and convert between degree and radian measure, identify a unit circle and describe its relationship to real numbers, evaluate trigonometric functions of any angle, use fundamental trigonometric identities.

## Semester 2

- Trigonometric Functions: Students will sketch graphs of trigonometric functions, evaluate inverse trigonometric functions, evaluate the compositions of trigonometric functions, and use trigonometric functions to model and solve real-life problems.
- Additional Trigonometry: Students will use the Law of Sines and the Law of Cosines to solve oblique triangles, and find the area of oblique triangles.
- Analytic Trigonometry: Students will use fundamental trigonometric identities to evaluate trigonometric functions and simplify trigonometric expressions; verify trigonometric identities; use standard algebraic techniques and inverse trigonometric functions to solve trigonometric equations; and use sum and difference formulas, multiple-angle formulas, power-reducing formulas, half-angle formulas, and product-to-sum formulas to rewrite and evaluate trigonometric functions.
- Sequences, Series, and Probability: Students will use sequence, factorial, and summation notation to write the terms and sums of sequences; recognize, write, and use arithmetic sequences and geometric sequences; use the Binomial Theorem and Pascal's Triangle to calculate binomial coefficients and write binomial expansions; solve counting problems using the Fundamental Counting Principle, permutations, and combinations; and find the probabilities of events and their complements.
- Limits and an Introduction to Calculus: Students will estimate limits and use properties and operations of limits; find limits by direct substitution and by using the dividing out and rationalizing techniques; approximate slopes of tangent lines, use the limit definition of slope, and derivatives to find slopes of graphs; evaluate limits at infinity and find limits of sequences; and find limits of summations and use them to find areas of regions bounded by graphs of functions.

**Board-Approved Instructional Materials**

- Larson, Hostetler, Edwards, *Precalculus with Limits A Graphing Approach*, McDougal Littell, 2005 ISBN 0-618-39479-6
- [http://college.hmco.com/mathematics/larson/precalculus\\_limits\\_aga/4e/students/index.html](http://college.hmco.com/mathematics/larson/precalculus_limits_aga/4e/students/index.html)

**Parents as Partners**

Family involvement is an essential element for a student’s success in mathematics. Be positive and support homework, don’t do it for them. Think of yourself as a guide rather than your child’s teacher. You can help by asking questions and listening. You may also help by visiting the online resources and encouraging your child to take advantage of the tutorials, interactive activities, and other online resources listed above

**Methods of Assessment**

Final exams should be cumulative in nature, emphasizing the most essential benchmarks for the course. Results of the final exam represent 20 percent of the final grade, but this single measure *may not* drop a student’s grade by more than one letter grade. In courses that rely heavily on a major project, performance exhibition, etc., the project should be divided into stages or components and each of those should be graded separately, providing students with frequent and specific feedback.

**Board-Approved Grading Scale**

Excerpts taken from School Board Rule 6452

**GRADING SCALE**

A+=98-100 percent	B+=86-89 percent	C+=76-79 percent	D+=66-69 percent
A=93-97 percent	B=83-85 percent	C=73-75 percent	D=63-65 percent
A-=90-92 percent	B-=80-82 percent	C-=70-72 percent	D-=60-62 percent
			F=0-59 percent

**MAKE-UP WORK**

Students submitting work up to ten school days late without prior approval may receive up to two grades lower on the work than they would have received if the work had been submitted on time (i.e., B+ lowered to a D+). Student work submitted after ten school days without prior approval shall not be accepted for credit and shall be recorded with a score of zero.

Upon returning to school after an absence, a student has the responsibility within the number of days equal to the length of the absence or suspension to meet with the teacher to develop a plan for making up missed work, quizzes, and examinations. A truant student has the responsibility on the first day he or she returns to the course/class to meet with the teacher to develop a plan for making up missed work, quizzes, and examinations. Lower grades may not be given for late work due to excused absences, suspension, or truancy unless the work is submitted later than agreed upon deadlines.

**See Rule 6452 in its entirety at: [www.kusd.edu](http://www.kusd.edu)**