PETERS TOWNSHIP HIGH SCHOOL
COURSE SYLLABUS: PRECALCULUS HONORS

Course Overview and Essential Skills

This course includes an in-depth study of functions: inverse, polynomial, rational, exponential, logarithmic, and trigonometric, systems of equations and inequalities, sequences and series, conic sections, and polar coordinates, and limits. Essential skills covered will include: solving equations, graphing and analyzing functions, understanding and applying the unit circle and trigonometric functions, and exploring and analyzing patterns, conic sections, and limits. The pace of this course will be accelerated commensurate with the ability of the class. Emphasis will be placed on applications using graphing calculators.

Course Textbook and Required Materials

- *Precalculus with Limits: A Graphing Approach.* Larson, Cengage Learning, ISBN# 978-1-305-11753-2
- Online textbook: LarsonPrecalculus.com
- Required daily materials: Textbook, Three-Ring Binder, Pencil, Graphing Calculator (TI-83 Plus, TI-84, or TI-84 Plus)

Course Outline of Material Covered:

Unit or Topic	Concepts/Skills/Resources	Timeframe
Prerequisites and Functions	Factoring, Circles, Linear Functions, Parent Functions, Transformations of Functions, Function Operations, Composite Functions, Inverse Functions, Linear Regression Chapter 1, Appendix B	4 weeks
Trigonometric Functions	Radian and Degree Measure, Unit Circle, Right Triangle Trigonometry, Graphing Trigonometric Functions, Inverse Trigonometric Functions, Trigonometric Regression Chapter 4	4 weeks
Analytic Trigonometry	Fundamental Identities, Verifying Trigonometric Identities, Solving Trigonometric Equations, Sum and Difference Formulas Chapter 5	3 weeks
Additional Trigonometric Topics	Law of Sines, Law of Cosines, Vectors, Dot Products, Complex Numbers Chapter 6	2 weeks

Polynomial and Rational Functions	Quadratic Functions, Polynomial Functions of Higher Order, Real Zeros of Functions, Complex Numbers, Fundamental Theorem of Algebra, Rational Functions and Asymptotes, Graphs of Rational Functions, Quadratic Regression Chapter 2	3 weeks
Exponential and Logarithmic Functions	Graphing Exponential and Logarithmic Functions, Properties of Logarithms, Solving Exponential and Logarithmic Equations, Exponential and Logarithmic Regression Chapter 3	3 weeks
Linear Systems and Matrices	Solving Systems of Equations (Graphing, Substitution, Elimination), Multivariable Linear Systems, Matrices and Systems of Equations, Operations with Matrices, Inverse Matrices, Determinants, Applications of Matrices and Determinants Chapter 7	4 weeks
Sequences and Series	Sequences and Series, Partial Sums, Binomial Theorem, Pascal's Triangle Chapter 8	3 weeks
Analytic Geometry	Circles, Ellipses, Hyperbolas, Parabolas, Parametric Equations, Polar Coordinates, Graphs of Polar Equations Chapter 9	3 weeks
Limits and an Introduction to Calculus	Limits (Graphically, Numerically, Analytically), Tangent Line Problem, Limits at Infinity and Infinite Limit Chapter 11	2 weeks

*__Depending on the needs of the class or changes in the school year, the course outline is subject to change.__