Syllabus for Statistics/Trigonometry/Analytical Geometry

 This class is designed to enhance and apply different units of statistical measure across many different settings, how to setup, read, and manipulate data given. An in-depth look at Sequences and Series is also used in the statistical analysis. Basic Trigonometric Functions, an analysis of their application and manipulations of their uses is employed in this class. A moderate look into the area of Analytical Geometry in which geometric cones and planar intersections is analyzed and dissected as well.

Topic: Exploring Data

 Concepts: Variables, Tables and Graphs

 Centers of Data and Weighted Averages

 Creating and Using Histograms

 Box Plots

 Cumulative Distributions

 Measures of Spread: Variance and Standard Deviation

 Comparing Numerical Distributions

 Using Statistics to Solve a Mystery: The Case of the Federalist

 Papers

 3.9 z-Scores

Topic: Counting, Probability and Inference

 Concepts: Introduction to Probability

 Principles of Probability

 Counting Strings with Replacement

 Counting Strings without Replacement

 Contingency Tables

 Conditional Probability

 Designing Simulations

 Two “Laws”, but Only One is Valid

 The Chi-Square Test

Topic: Sequences and Series

 Concepts: Arithmetic Sequences

 Geometric and Other Sequences

 End Behavior of Sequences

 Arithmetic Series

 Geometric Series

 How Much Does a Loan Cost?

 Infinite Series

Topic: Binomial Distributions

 Concepts: Combinations

 Pascal’s Triangle

 The Binomial Theorem

 Probability Distributions

 Binomial Probabilities

 Binomial Probability Distributions

 Mean and Standard Deviation of a Binomial Random Variable

 Is That Coin Fair?

Topic: Trigonometric Functions

 Concepts: Magnitudes of Rotations and Measures of Arcs

 Sines, Cosines, and Tangents

 Basic Trigonometric Identities

 Exact Values of Sines, Cosines, and Tangents

 The Sine and Cosine Functions

 The Tangent Function and Periodicity

 Scale-Change Images of Trigonometric Functions

 Translation Images of Trigonometric Functions

 The Graph-Standardization Theorem

 Modeling with Trigonometric Functions

Topic: Trigonometry

 Concepts: Trigonometric Ratios in Right Triangles

 The Inverse Cosine Function

 The Law of Cosines

 The Inverse Sine Function

 The Law of Sines

 The Inverse Tangent Function

 General Solutions to Trigonometric Equations

 Parametric Equations for Circles and Elipses

 The Secant, Cosecant, and Cotangent Functions

 From New York to New Delhi

Topic: Matrices and Trigonometry

 Concepts: Matrix Multiplication

 Matrices for Transformations

 Matrices for Composites of Transformations

 The General Rotation Matrix

 Identities for cos (a + b) and sin (a + b)

 Identities for cos 2⍬ and sin 2⍬

Topic: Further Work with Trigonometry

 Concepts: Proving Trigonometric Identities

 Restrictions on Trigonometric Identities

 Polar Coordinates

 Polar Graphs

 The Geometry of Complex Numbers

 Trigonometric Form of Complex Numbers

 DeMoivre’s Theorem

Topic: Analyzing Functions

 Concepts: Trigonometry and the Unit Circle

 Trigonometric Functions

Topic: Algebraic Fractions and Identities

 Concepts: Proving Identities

 Sum and Difference Formulas

 Using Identities