



## **(2345) Honors Math Analysis**

Grades 10 – 12

5 Credits, 1 Year

### **Course Description:**

In Honors Math Analysis, students will continue their study of trigonometric functions. They will also be introduced to new topics, such as parametric equations, discrete probability & combinatorics, polar coordinates, vectors, matrices, and an introduction to calculus that includes derivatives. Emphasis is placed on the use of a graphing calculator, interpretation of graphs and applications in “real world” situations. A TI-84+ graphing calculator is required. The student must complete a summer assignment prior to entering the course.

### **Proficiencies:**

Upon completion of this course the student should be able to

- Extend the domain of trigonometric functions using the unit circle.
- Model periodic phenomena with trigonometric functions.
- Prove and apply trigonometric identities.
- Define trigonometric ratios and solve problems involving right triangles.
- Apply trigonometry to oblique triangles.
- Understand polar coordinates, and graph various polar equations.
- Represent and model with vector quantities.
- Perform operations on vectors.
- Perform operations on matrices and use matrices in applications.
- Graph plane curves.
- Find parametric equations for functions and understand their advantages.
- Find recursive and explicit formulas for arithmetic and geometric sequences.
- Find the sums of finite arithmetic and geometric series and an infinite geometric series that diverges.
- Use sigma notation to represent sums of series.
- Understand and use mathematical induction.
- Use the Binomial Theorem to expand powers of binomials.
- Distinguish between permutations and combinations and be able to calculate them.
- Distinguish between empirical and theoretical probabilities.
- Understand independence and conditional probability
- Apply the concept of limits to differential calculus.
- Find the derivative of a function using the definition.

### **Course Requirements**

Students will be expected to:

1. Do all homework assignments.
2. Have a graphing calculator at all times.
3. Take periodic quizzes and tests

### **Evaluation:**

Marking period grades will be determined as follows:

90% performance assessments

10% homework