

## COURSE PROFICIENCY OUTLINE PRE-CALCULUS – 2322

**College Prep** 5 Credits

### Purpose

This course is designed for the above-average math student who has shown a marked proficiency in the college prep and/or honors level math curriculum during the first three years. The purpose of the course is to unify the mathematics covered in other courses and bridge the gap between Advanced Algebra and Calculus. Among the functions studied are: algebraic, exponential, logarithmic, trigonometric, as well as their relationships, inverses, graphs and uses.

### I. Student Outcomes - 4.2, 4.3, 4.5

- A. The student will demonstrate a profound knowledge of The Fundamental Concepts of Algebra.
- B. The student will demonstrate the ability to readily solve Equations and Inequalities of Various Degrees.
- C. The student will demonstrate the ability to deal with and understand Basic Functions of Algebra.
- D. The student will demonstrate an understanding of Exponential and Logarithmic Functions.
  - E. The student will demonstrate an understanding of The Trigonometric Functions.
  - F. The student will demonstrate an understanding of Analytic Trigonometry.
  - G. The student will demonstrate an understanding of and the ability to Solve Various Systems of Equations and Inequalities.
- H. The student will demonstrate an understanding of Polynomial and Rational Functions.
- I. The student will demonstrate the ability to deal with various Topics in Analytic Geometry.
- J. The student will demonstrate a clear understanding of various Topics in Advanced Algebra.

### II. Content - 4.2, 4.3, 4.5

- A. Fundamental Concepts of Algebra
  - 1 Real numbers
  - 2 Coordinate lines
  - 3 Integral exponents
  - 4 Radicals
  - 5 Rational exponents
  - 6 Polynomials and algebraic expressions
  - 7 Factoring
  - 8 Fractional expressions
- B. Equations and Inequalities
  - 1 Linear equations
  - 2 Quadratic equations
  - 3 Miscellaneous equations
  - 4 Inequalities
- C. Basic Functions of Algebra

1. Coordinate systems in two dimensions
2. Graphs
3. Functions
4. Graphs of functions
5. Linear functions
6. Composite and inverse functions
7. Quadratic functions

D. Exponential and Logarithmic Functions

1. Exponential functions
2. Logarithms
3. Logarithmic functions
4. Common logarithms
5. Exponential and logarithmic equations
6. Computations with logarithms

E. Trigonometric Functions (Reviewed and Reinforcement)

1. Angles
2. Trigonometric functions of acute angles
3. Applications involving right triangles
4. General trigonometric functions
5. Values of trigonometric functions
6. Graphs of trigonometric functions
7. Trigonometric graphs and graphical techniques

F. Analytic Trigonometry

1. The fundamental identities
2. Trigonometric identities
3. Trigonometric equations
4. The addition formulas
5. Multiple angle formulas
6. Sum and product formulas
7. The inverse trigonometric functions

G. Systems of Equations and Inequalities

1. Systems of equations
2. Systems of linear equations in two variables
3. Systems of linear equations in more than two variables

H. Polynomial and Rational Functions

1. Properties of division
2. Synthetic division
3. Factorization theory
4. Zeros of polynomials with real coefficients
5. Rational functions

I. Topics in Analytic Geometry

1. Circles
2. Lines
3. Conic sections
4. Parabolas
5. Ellipses
6. Hyperbolas

**III. Materials**

- A. Text: Advanced Mathematics: Precalculus w/Discrete Mathematics & Data

Analysis, McDougal-Littell, Inc.

- B. Notebook and pencils must be provided by the student.
- C. Calculators and Graphing calculators are very necessary for each individual student and will be provided when working with those units.

IV. **Evaluation**

- A. The student will be expected to complete classwork, homework, keep a notebook and take tests and quizzes. These will be checked and reviewed by the teacher.
- B. The student will be expected to demonstrate an acceptable level of proficiency in the objectives and content of this course.
- C. The student will be expected to demonstrate at all times appropriate classroom behavior such as self-control, respect for others, respect for property and a mature attitude.
- D. The student will be expected to adhere to the school rules and regulations for behavior and the district policy for attendance.
- E. Students will be required to successfully pass the High School Proficiency Assessment as mandated in the graduation law (N.J.S.A. 6:8-4.2).
- F. Students who fail the HSPA examination will be placed in a Basic Skills Math class as required by N.J.S.A. 6:8-4.2. There will be no exceptions to this requirement.
- G. The student will be expected to take a comprehensive final exam covering the entire school year's work. This exam will count at 1/5 of the final grade.
- H. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.

Reviewed and Revised July 2010  
Reviewed August 2011