

Florida Department of Education

COURSE DESCRIPTION - GRADES 9-12, ADULT

Subject Area: Mathematics
Course Number: 1206330
Course Title: Analytic Geometry
Credit: .5

Will meet graduation requirement for Mathematics

Basic Assumptions for Mathematics Education:

- All students have access to calculators and computers.
- Classroom activities are student-centered, emphasizing concrete experiences and active/experiential learning.
- All courses have increased emphasis on problem solving, estimation, and real-world applications.
- Evaluation includes alternative methods of assessment.
- All strands addressed in the Sunshine State Standards are developed across the PreK-12 curriculum.

- A. Major Concepts/Content.** The purpose of this course is to develop an understanding of the relationship between algebra, geometry, and trigonometry.

The content will include, but not be limited to, the following:

- linear equations
- graphs and curve sketching
- Cartesian and polar coordinate systems
- analytic proofs
- vectors
- conic sections, including transformations of axes
- equations and graphs in polar form
- parametric equations
- applications to real-world problem solving

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the subject matter.

- B. Special Note.** Students earning credit in Pre-Calculus may not earn credit in both Trigonometry and Analytic Geometry.
- C. Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. Some requirements in this advanced mathematics course are not addressed in the Sunshine State Standards, and some of the cited benchmarks are prerequisite to the course requirement.

After successfully completing this course, the student will:

- 1. Demonstrate the ability to determine distances within the Cartesian coordinate system.**
 - MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc lengths.
 - MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.
 - MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).
 - MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.
 - MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
 - MA.D.1.4.2 determine the impact when changing parameters of given functions.

- 2. Demonstrate the ability to solve systems of equations.**
 - MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, and with matrices.

3. **Demonstrate an understanding of polynomial and rational functions, their parametric equations, and their graphs.**
 - M.A.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.
 - MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
 - MA.D.1.4.2 determine the impact when changing parameters of given functions.

4. **Demonstrate an understanding of conic sections and other loci.**
 - MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.
 - MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).
 - MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
 - MA.D.1.4.2 determine the impact when changing parameters of given functions.

5. **Demonstrate an understanding of the polar coordinate system and its relationship to the Cartesian coordinate system.**

6. **Demonstrate the ability to solve problems using vectors.**
 - MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

7. **Demonstrate the ability to verify a conclusion by applying the properties of analytic geometry.**
 - M.A.C.1.4.1 use properties and relationships of geometric shapes to construct formal and informal proofs.
 - M.A.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.
 - M.A.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.