

Florida Department of Education

COURSE DESCRIPTION – GRADES 9-12, ADULT

Subject Area: Mathematics

Course Number:

Course Title: Mathematics for College Readiness

Credit: 1.0

Will meet graduation requirements for Mathematics

Basic assumptions regarding mathematics education:

- ◆ all students will have access to calculators and computers;
- ◆ classroom activities will include student centered instructional strategies;
- ◆ all courses will have increased emphasis on estimation and number sense;
- ◆ articulation with the community college is critical for development of college readiness;
- ◆ benchmarks for Language Arts that include correct use of punctuation, capitalization, grammar and sentence structure are incorporated in this course to ensure success on college level placement tests;
- ◆ evaluation will include alternative methods of assessment; and
- ◆ all strands addressed in Next Generation Sunshine State Standards in Mathematics are developed across the PreK-12 curriculum.

A. Major Concepts/Content

The purpose of this course is to strengthen the skill level of high school seniors who have completed Algebra I, II, and Geometry and who wish to pursue credit generating mathematics courses at the college level.

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

- Functions and Relations
- Polynomials
- Rational Expressions and Equations
- Radical Expressions and Equations
- Quadratic equations
- Logarithmic and Exponential Functions
- Matrices
- Simple and Compound Interest
- Descriptive Statistics
- Vocabulary
- Edit Writing for Correct Use of Punctuation, Capitalization, Grammar and Sentence Structure
- Strategies for College Readiness

## B. Course Requirements

These requirements include the benchmarks from the Next Generation Sunshine State Standards in Mathematics that are most relevant to this course. Designated requirements (\*) in this course are not addressed in the Next Generation Sunshine State Standards for Mathematics, including career and college readiness benchmarks.

After successfully completing this course the student will:

### 1. Demonstrate an understanding of relations and functions.

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|---------------|---|
| MA.912.A.2.4  | Determine domain and range of a relation  |
| MA.912.A.2.5  | Graph absolute value equations and inequalities in two variables  |
| MA.912.A.2.6  | Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value). |
| MA.912.A.2.8  | Determine the composition of functions.   |
| MA.912.A.2.9  | Recognize, interpret, and graph functions defined piece-wise, with and without technology.                                      |
| MA.912.A.2.10 | Describe and graph transformations of functions   |
| MA.912.A.2.11 | Solve problems involving functions and their inverses.  |
| MA.912.A.2.12 | Solve problems using direct, inverse, and joint variations.   |
| MA.912.A.2.13 | Solve real-world problems involving relations and functions.  |

### 2. Demonstrate an understanding of polynomials

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|--------------|---|
| MA.912.A.4.6 | Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function. |
| MA.912.A.4.7 | Write a polynomial equation for a given set of real and/or complex roots.   |
| MA.912.A.4.8 | Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology.   |

3. Demonstrate an understanding of rational expressions and equations.

- MA.912.A.5.1 Simplify algebraic ratios.
- MA.912.A.5.2 Add, subtract, multiply, and divide rational expressions.
- MA.912.A.5.3 Simplify complex fractions.
- MA.912.A.5.5 Solve rational equations.
- MA.912.A.5.6 Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function.
- MA.912.A.5.7 Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio).

4. Demonstrate an understanding of radical expressions and equations.

- MA.912.A.6.1 Simplify radical expressions
- MA.912.A.6.2 Add, subtract, multiply and divide radical expressions (square roots and higher).
- MA.912.A.6.3 Simplify expressions using properties of rational exponents.
- MA.912.A.6.4 Convert between rational exponent and radical forms of expressions.
- MA.912.A.6.5 Solve equations that contain radical expressions.

5. Demonstrate an understanding of quadratics.

- MA.912.A.7.5 Solve quadratic equations over the complex number system.
- MA.912.A.7.7 Solve non-linear systems of equations with and without using technology.
- MA.912.A.7.8 Use quadratic equations to solve real-world problems.
- MA.912.A.7.10 Use graphing technology to find approximate solutions of quadratic equations.

6. Demonstrate an understanding of logarithmic and exponential functions.

- MA.912.A.8.2 Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values.
- MA.912.A.8.3 Graph exponential and logarithmic functions.

MA.912.A.8.5 Solve logarithmic and exponential equations.

MA.912.A.8.6 Use change of base formula

7. Demonstrate the ability to perform operations on matrices.

MA.912.D.8.1 Use matrices to organize and store data. Perform matrix operations (addition, subtraction, scalar multiplication, multiplication)

MA.912.D.8.2 Use matrix operations to solve problems.

MA.912.D.8.4 Find the inverse of a matrix and use the inverse to solve problems with and without the use of technology.

8. Demonstrate an understanding of compound and simple interest.

MA.912.F.1.1 Explain the difference between simple and compound interest.

MA.912.F.1.2 Solve problems involving compound interest.

MA.912.F.1.3 Demonstrate the relationship between simple interest and linear growth

MA.912.F.1.4 Demonstrate the relationship between compound interest and exponential growth

MA.912.F.2.1 Calculate the future value of a given amount of money, with and without technology.

9. Demonstrate an understanding of descriptive statistics.

MA.912.S.3.3 Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data.

10. \*Develop an understanding of vocabulary development, background knowledge, pre-reading strategies, pre-writing for making a plan and organizational strategies.

LA.1112.1.6.1 The student will use new vocabulary that is introduced and taught directly;

LA.1112.1.7.1 The student will use background knowledge of subject and related content areas, pre-reading strategies (e.g., previewing, discussing, generating questions), text features, and text structure to make and confirm complex predictions of content, purpose, and organization of a reading selection;

- LA.1112.3.4.1 The student will edit for correct use of spelling, using spelling rules, orthographic patterns, generalizations, knowledge of root words, prefixes, suffixes, knowledge of Greek, Latin, and Anglo-Saxon root words, and knowledge of foreign words commonly used in English (laissez faire, croissant);
- LA.1112.3.4.2 The student will edit for correct use of capitalization, including names of academic courses and proper adjectives;
- LA.1112.3.4.3 The student will edit for correct use of punctuation, including commas, colons, semicolons, apostrophes, dashes, quotation marks, parentheses, ellipses, brackets, and underlining or italics;
- LA.1112.3.4.4 The student will edit for correct use of grammar and usage, including but not limited to parts of speech, verb tense, noun/pronoun agreement, subject/verb agreement, pronoun/antecedent agreement, parallel structure, modifier placement, comparative and superlative adjectives and adverbs, and unintended shift in person or tense; and
- LA.1112.3.4.5 The student will edit for correct use of varied sentence structure, including the elimination of dangling or misplaced modifiers, run-on or fused sentences, and unintended sentence fragments.

11. \*Demonstrate an understanding of skills and strategies necessary for college entrance in and completion of mathematics courses for credit.

Identify post secondary courses and major areas of interest that meet tentative career plans.

Identify the advantages and disadvantages of entering various postsecondary programs for the attainment of career goals.

Demonstrate knowledge of varied types and sources of financial aid to obtain assistance for postsecondary education.

Develop a career and education plan that includes short and long term goals for postsecondary and future career.

Describe how extracurricular programs can be incorporated in career and education planning

Develop an understanding of course work, GPA and assessments needed for college entrance.