Florida Department of Education

COURSE DESCRIPTION - GRADES 9-12, ADULT

Subject Area:	Mathematics
Course Number:	1200380
Course Title:	Algebra Ib
Credit:	1.0

Will meet graduation requirements 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 the algebraic concepts and processes that can be used to solve a variety of real world and mathematical problems. This is the second of a two year sequence of courses, Algebra Ia and Algebra Ib.　Together, the two courses have the same requirements as Algebra I, Course Number 1200310.

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

-　　structure and properties of the real number system, including rational and irrational numbers

-　　algebraic notation including exponents, square roots, radicals, absolute value, and scientific notation

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- varied means for analyzing and expressing patterns, relations, and functions, including words, tables, graphs, sequences, linear and quadratic equations, and inequalities

- polynomials and operations with polynomials

- coordinate geometry and graphing of linear and quadratic functions and inequalities

- data analysis concepts and techniques including introductory statistics and probability

- varied solution strategies, algebraic and graphic, for linear and quadratic equations and for systems of equations

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

B. **Special Note.** Completion of both 1200370 – Algebra Ia and 1200380 – Algebra Ib meets the Algebra I graduation requirement. The Algebra I graduation requirement may be met through one of the following options:

1. 1200310 - Algebra I
2. 1200320 - Algebra I Honors
3. 1200370 - Algebra Ia and 1200380 - Algebra Ib
4. 1205400 - Applied Mathematics I and 1205410 - Applied Mathematics II
5. 1207310 - Integrated Mathematics I and 1207320 - Integrated Mathematics II
6. 1200500 - Pacesetter Mathematics I

Credit cannot be granted for more than one of the above options. To meet the needs of transfer students, portions of options may be combined to assure mastery of Algebra I content.

Higher-level mathematics courses may be used to satisfy the Algebra I graduation requirement in cases where (1) a student has completed Algebra I prior to high school or has otherwise demonstrated mastery of the content and (2) the high school transcript does not reflect completion of one of the options listed above. Higher-level courses that may substitute for the Algebra I requirement are Algebra II, Integrated Mathematics III, Pacesetter III, or any Level 3 mathematics course.

Although 1200370 – Algebra Ia and 1200380 – Algebra Ib provide two credits toward high school graduation requirements, the combination of the two courses equates to one unit of Algebra I for admission to the State University System of Florida and for eligibility for two of the Bright Futures Scholarships (i.e., the Florida Academic Scholars Award and the Florida Merit Scholars Award).

C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

(**Note:** To meet the needs of students and teachers, districts may place some Algebra Ib, Course Number 1200380, requirements in Algebra Ia, Course Number 1200370.)

After successfully completing this course, the student will:

1. **Demonstrate understanding of the different ways numbers are represented and used in the real world.**

   MA.A.1.4.1   associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.

   MA.A.1.4.2   understand the relative size of integers, rational numbers, irrational numbers, and real numbers.

   MA.A.1.4.3   understand concrete and symbolic representations of real *and complex* numbers in real-world situations.

   MA.A.1.4.4   understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

2. **Demonstrate understanding of number systems.**

   MA.A.2.4.1   understand *and use* the basic concepts of limits and infinity.

   MA.A.2.4.2   understand and use the real number system.

3. **Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.**

MA.A.3.4.2   select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.

MA.A.3.4.3   add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

4. **Use estimation in problem solving and computation.**

MA.A.4.4.1   use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. **Demonstrate understanding and apply theories related to numbers.**

MA.A.5.4.1   apply special number relationships such as sequences *and series* to real-world problems.

6. **Estimate measurements in real-world problem situations.**

MA.B.3.4.1   solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

7. **Use coordinate geometry to locate objects in two dimensions and to describe objects algebraically.**

MA.C.3.4.1   represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry.*

      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.

8. **Describe, analyze, and generalize a wide variety of patterns, relations, and functions.**

      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.

9. **Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.**

      MA.D.2.4.1   represent real-world problem situations using finite graphs, matrices, sequences, *series, and recursive relations.*

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

10. **Demonstrate understanding and use the tools of data analysis for managing information.**

      MA.E.1.4.1   interpret data that has been collected, organized, and displayed in charts, tables, and plots.

      MA.E.1.4.2   calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for complex sets of data and determine the most meaningful measure to describe the data**.**

      MA.E.1.4.3   analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

11. **Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.**

> MA.E.2.4.1   determine probabilities using counting procedures, tables, tree diagrams *and formulas for permutations and combinations.*
>
> MA.E.2.4.2   determine the probability for simple and compound events as well as independent and dependent events.

12. **Use statistical methods to make inferences and valid arguments about real-world situations.**

> MA.E.3.4.1   design and perform real-world statistical experiments that involve more than one variable, then analyze results and report findings.
>
> MA.E.3.4.2   explain the limitations of using statistical techniques and data in making inferences and valid arguments.