

COURSE OUTLINE**Developmental Skills Lab 023
Algebra IA****I. Catalog Statement**

Developmental Skills Lab 023 introduces students to algebraic vocabulary, solving equations with one variable, and working with polynomials and algebraic fractions. This course is designed to meet the needs of students who wish to begin their study of algebra and to earn high school credit in math.

Units — 0.0

Total Laboratory Hours — 100.0

Recommended preparation: ESL 040 or equivalent
DSL 022 or equivalent

Note: This is a self-paced course in an open-entry, open-exit lab environment. Successful completion of this course is worth 5 credits (.5 unit) towards a high school diploma.

II. Course Entry Expectations

Skills Level Ranges: Reading: 5; Writing: 3; Listening/Speaking: 4; and Math: 3.

III. Course Exit Standards

Upon successful completion of this course, the student will be able to:

1. simplify expressions;
2. express a particular variable in terms of other variables;
3. use several methods of factoring polynomials;
4. add, subtract, multiply, and divide polynomials;
5. simplify algebraic fractions;
6. compute problems which involve positive and negative exponents;
7. express values in scientific notation.

IV. Course Content

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| A. | Introduction to Algebra | 20 hours |
| 1. | Variables and equations | |
| a. | variables | |
| b. | grouping symbols | |
| c. | equations | |

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| | 2. | Applications and problem solving | |
| | a. | translating words into symbols | |
| | b. | translating sentences into equations | |
| | c. | translating problems into equations | |
| | 3. | Numbers on a line | |
| | a. | number lines | |
| | b. | opposites and absolute values | |
| B. | | Working with Real Numbers | 15 hours |
| | 1. | Addition and subtraction | |
| | a. | basic assumptions | |
| | b. | addition on a number line | |
| | c. | rules for addition | |
| | d. | subtraction of real numbers | |
| | 2. | Multiplication | |
| | a. | the distributive property | |
| | b. | rules for multiplication | |
| | 3. | Division | |
| C. | | Solving Equations and Problems | 15 hours |
| | 1. | Transforming equations | |
| | a. | addition and subtraction | |
| | b. | multiplication and division | |
| | c. | multiple operations | |
| | 2. | Solving problems | |
| | a. | one variable | |
| | b. | variable on both sides | |
| | c. | use of charts | |
| D. | | Polynomials | 15 hours |
| | 1. | Addition and subtraction | |
| | 2. | Multiplication | |
| | a. | multiplying monomials | |
| | b. | transforming formulas | |
| | c. | rate-time-distance problems | |
| | d. | area –problems | |
| E. | | Factoring Polynomials | 20 hours |
| | 1. | Quotients and factoring | |
| | a. | factoring integers | |
| | b. | dividing monomials | |
| | c. | monomial factors of polynomials | |
| | 2. | Products and factors | |
| | a. | multiplying binomials mentally | |
| | b. | differences of two squares | |
| | c. | squares of binomials | |
| | 3. | Factoring patterns | |
| | a. | factoring pattern for $x^2 + bx + c$, c positive | |
| | b. | factoring pattern for $x^2 + bx + c$, c negative | |
| | c. | factoring pattern for $ax^2 + bx + c$ | |
| | 4. | General factoring and its application | |

- a. factoring by grouping
 - b. “trial and error” factoring
 - c. solving equations by factoring
- F. Fractions 15 hours
- 1. Algebraic fractions
 - a. simplifying fractions
 - b. multiplying fractions
 - c. dividing fractions
 - 2. Adding and subtracting fractions
 - a. least common denominators
 - b. adding and subtracting fractions
 - 3. Polynomial division
 - a. mixed expressions
 - b. polynomials long division

V. Methods of Presentation

The following instructional methodologies may be used in the course:

1. independent study using worksheets and texts;
2. computer-aided instruction;
3. small group instruction;
4. video instruction.

VI. Assignments and Methods of Evaluation

1. Students must complete the entire individualized contract.
2. Students complete assessments at the end of each chapter.
3. Unit tests.

VII. Textbook

Brown R., Dolciani M., Sorgenfrey R., Cole W. Algebra.
Boston: Houghton Mifflin Company, 1990.
11th Grade Textbook Reading Level. ISBN: 0-395-46140-5

VIII. Student Learning Outcome

- demonstrate ability and understanding of operations involving all real numbers including natural, whole, integers, rational and irrational number sets;
- simplify numeric and variable expressions;
- use transformations of equality/inequality to solve first degree linear equations in one variable;
- apply the principles of factoring, operations with rational numbers, ratio and proportion to solve algebraic real world problems.