

Jefferson College

COURSE SYLLABUS

MTH084

ELEMENTARY ALGEBRA

4 Credit Hours

Prepared by:

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MTH084: ELEMENTARY ALGEBRA

I. CATALOG DESCRIPTION

- A. Course pre-requisites/co-requisites: COMPASS pre-algebra score of at least 25 within the past two years, ACCUPLACER arithmetic score of at least 60 within the past two years, ACCUPLACER elementary algebra score of at least 31 within the past two years, ACT math score of 16 or higher within the past two years, or MTH001 Basic Math with a grade of “B” or better, and reading proficiency
- B. 4 semester credit hours
- C. Elementary Algebra is designed for the student who has had no prior instruction in algebra. The student will work with operations of signed numbers, exponents, rational expressions, graphs, and linear equations. Elementary Algebra is not applicable toward the associate degree (F, S, Su, O)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Note: Each of the following learning outcomes will be measured on at least one in-class exam, but instructors are encouraged to assess them with additional measures including homework, quizzes, and/or projects

Students will:

| Expected Learning Outcomes | Assessment Measures |
|---|--|
| Perform operations on fractions and signed numbers | Class discussion/practice, homework, and quizzes/tests |
| Use algebraic properties and order of operations to simplify algebraic expressions, and to convert algebraic expressions into alternate forms | Class discussion/practice, homework, and quizzes/tests |
| Use appropriate techniques to solve linear equations and linear inequalities | Class discussion/practice, homework, and quizzes/tests |
| Translate word problems into algebraic form and solve them | Class discussion/practice, homework, and quizzes/tests |
| Perform arithmetic operations with polynomials | Class discussion/practice, homework, and quizzes/tests |

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|---|--|
| Use appropriate techniques to completely factor polynomial expressions with integer coefficients in order to solve quadratic equations | Class discussion/practice, homework, and quizzes/tests |
| Find restrictions, simplify, multiply, and find the least common denominator of rational expressions | Class discussion/practice, homework, and quizzes/tests |
| Plot points in the rectangular coordinate system, graph linear equations, describe linear graphs as increasing, decreasing, or constant, and solve applications of linear relationships | Class discussion/practice, homework, and quizzes/tests |
| Understand functions and use function notation for linear functions, including simple expression arguments | Class discussion/practice, homework, and quizzes/tests |
| Solve simple radical equations that demonstrate the inverse like relationship of square roots and squaring | Class discussion/practice, homework, and quizzes/tests |
| Use properties of radicals to simplify radical expressions with numerical arguments and rewrite expressions containing negative and rational exponents | Class discussion/practice, homework, and quizzes/tests |

III. OUTLINE OF TOPICS

- A. Pre-algebra review
 1. Simplifying fractions
 2. Adding and subtracting fractions
 3. Multiplying and dividing fractions
 4. Using decimals
 5. Percentages, rounding, and estimating

- B. Real numbers and variables
 1. Adding, subtracting, multiplying, and dividing real numbers
 2. Exponents and order of operations
 3. Using the distributive property to simplify algebraic expressions
 4. Combining like terms
 5. Using substitution to evaluate expressions and formulas
 6. Grouping symbols

- C. Equations and inequalities
 1. The addition principle of equality
 2. The multiplication principle of equality
 3. Using the addition and multiplication principles together
 4. Solving equations with fractions

5. Formulas
 6. Solving inequalities in one variable
- D. Solving applied problems
1. Translating English phrases into algebraic expressions
 2. Using equations to solve word problems
 3. Solving word problems involving comparisons, the value of money, percentages, and geometric formulas
 4. Using inequalities to solve word problems (optional)
- E. Exponents and polynomials
1. The rules of exponents
 2. Negative exponents and scientific notation
 3. Addition, subtraction, multiplication, and division of polynomials.
 4. Completing the square for quadratic expressions
- F. Factoring
1. Removing a common factor
 2. Factoring by grouping
 3. Factoring trinomials of the form $x^2 + bx + c$
 4. Factoring trinomials of the form $ax^2 + bx + c$
 5. Special cases of factoring
 6. Solving quadratic equations by factoring
- G. Rational expressions
1. Simplifying rational expressions, including restrictions
 2. Multiplying rational expressions
 3. Finding the least common denominator of rational expressions
- H. Graphing and functions
1. Rectangular coordinate system
 2. Graphing linear equations
 3. Slope of a line
 4. Features of graphs
 5. Linear applications and models
 6. Functions
- I. Radicals
1. Square roots and cube roots
 2. Simplifying radical expressions with numerical arguments
 3. Solving simple radical equations
 4. Understanding integer and rational exponents

IV. METHODS OF INSTRUCTION

- A. Lecture

- B. Discussion
- C. In-class activities
- D. MyMathLab interactive assignments

V. REQUIRED TEXTBOOK(S)

- A. Tobey, J. *Beginning Algebra* (Current Edition). Upper Saddle River, N.J.: Pearson Prentice Hall.
- B. *MyMathLab - Standalone Access Card*. Pearson

VI. REQUIRED MATERIALS

- A. Notebook paper and pencils
- B. Calculator as required by the instructor (scientific recommended)

VII. SUPPLEMENTAL REFERENCES

Contained within MyMathLab:

- A. Student solutions manual
- B. Study plan

VIII. METHODS OF EVALUATION

- A. Homework 10% - 20%
Students will submit homework in MyMathLab but are expected to keep written solutions for all work submitted. Additional problems from the textbook may also be assigned
- B. Classwork 0% - 20%
Additional worksheets and projects may be assigned at the discretion of the instructor to reinforce various concepts
- C. Quizzes 0% - 20%
Both in-class and online quizzes may be used to evaluate mastery of concepts
- D. Tests 30% - 60%
There will be a minimum of three unit tests, each covering 1 - 2 chapters of material. These exams may be administered on paper or online

- E. Comprehensive final examination 15% - 25%
All students will be required to take a comprehensive final exam, the score of which must be included in the final course grade

IX. ADA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.