

COURSE OUTLINE **Fundamentals of Algebra**

Course Description

MA 060. Fundamentals of Algebra. 3 hours credit. Prerequisite: Placement score or MA 050 with a C or better. This course will enable the student to interpret mathematical symbols and notation, simplify expressions and solve equations and inequalities. The student will gain confidence in math ability through improved study habits. The student will begin to conceptualize abstract ideas.

Course Relevance

The concepts learned in this course will improve the student's math skills, leading to success in subsequent courses. The student's ability to think analytically will improve. The student's study habits will also improve. The student will begin to develop an appreciation of mathematics.

Required Materials

Lial, M. L., Hornsby, J., and McGinnis, T. (2008). *Beginning and Intermediate Algebra* (4th ed.). Boston, MA: Pearson, Addison Wesley.

Scientific calculator: The student is responsible for the knowledge necessary to use any make of scientific calculator.

Supplemental Materials

Cole, J., (2008). *Beginning and Intermediate Algebra* (4th ed.). *Student's Solutions Manual*.

Learning Outcomes

The intention is for the student to be able to:

1. Use study skills and problem solving to be successful in their future learning.
2. Use and interpret mathematical symbols and notation.
3. Perform mathematical procedures and techniques correctly.
4. Conceptualize abstract ideas.

Learning PACT Skills that will be DEVELOPED and documented in this course

Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Analytical Thinking Skills

1. Problem solving
 - Through the process of learning to solve multi-step problems and real world application problems, the student will develop not only the general concepts involved in problem solving, but skills that can also be applied and transferred to

real life analytical situations.

Communication Skills

1. Reception and interpretation of messages
 - Through the process of working through application problems, the student will develop the ability to interpret and evaluate real world application problems from text form into a mathematical equation.

Technology Skills

1. Discipline-specific technology
 - Through the use of scientific calculators, the student will learn basic skills involved in problem solving with the aid of visual graphs and immediate calculations that apply to mathematics and real world situations.

Major Summative Assessment Task(s)

These learning outcome(s) and Learning PACT skill(s) will be demonstrated by:

1. Taking a course final exam (A skill) including open-ended questions that require conceptualization of abstract ideas (C skill) and accurate performance of mathematical procedures including the use of a scientific calculator (T skill).

Course Content

- I. Skills/Competencies - Actions that are essential to achieve the course outcomes:
 - A. Operations with fractions and integers
 - B. Solving equations
 - C. Factoring
 - D. Operations with polynomials
 - E. Operations with exponents
 - F. Order of operations
- II. Themes - Key recurring concepts that run throughout this course:
 - A. Problem solving
 - B. Applications
 - C. Simplifying expressions
 - D. Solving equations
- III. Issues - Key of conflict that must be understood in order to achieve the intended outcome:
 - A. Math anxiety
 - B. Test-taking anxiety
 - C. Time management
 - D. Preparation
 - E. Study skills
- IV. Concepts – Key concepts that must be understood to address the issues:
 - A. Basic arithmetic skills
 - B. Individual responsibility and commitment

Learning Units

- I. Real numbers
 - A. Fractions
 - B. Exponents, order of operations, inequalities

- C. Variables, expressions, equations
 - D. Real numbers and the number line
 - E. Adding and subtracting real numbers
 - F. Multiplying and dividing real numbers
 - G. Properties of real numbers
 - H. Simplifying algebraic expressions
- II. Equations and inequalities
- A. Solving basic equations
 - B. Solving more equations
 - C. Simplifying expressions to solve equation
 - D. Introduction to problem solving
 - E. Formulas
 - F. Ratios and proportions
 - G. Solving inequalities
- III. Polynomials and Exponents
- A. Rules for using exponents
 - B. Zero and negative-integer exponents
 - C. Scientific notation
 - D. Adding and subtracting polynomials
 - E. Multiplying polynomials
 - F. Dividing polynomials
- IV. Factoring and applications
- A. The greatest common factor; factoring by grouping
 - B. Factoring trinomials x^2+bx+c
 - C. Factoring trinomials ax^2+bx+c
 - D. Special factoring rules
- V. Rational expressions and applications
- A. The fundamental property of rational expressions
 - B. Multiplying and dividing rational expressions
 - C. Least common denominator
 - D. Adding and subtracting rational expressions
 - E. Complex fractions

Learning Activities

Independent learning activities will be assigned to assist the student to achieve the intended learning outcomes. Activities identified in the syllabus, such as class discussion, lecture, reading, group work or projects, will also contribute to learning.

Grade Determination

Grade determination will be based on assessment tasks and other activities such as exams, assignments or class participation that the instructor identifies in the syllabus.