

COURSE OUTLINE

Basic Algebra Concepts

Course Description

MA 040. Basic Algebra Concepts. 1 hour credit. Prerequisite: A score at a pre-determined level on a diagnostic and placement instrument or MA 020 with a C or better. This course will enable the student to use basic algebra concepts including signed numbers, equation solving, word problems, exponents, roots, and polynomials.

Course Relevance

The principles learned in this course allow a student to use math skills in real life application problems and prepare for higher level math classes.

Required Materials

Howett, J. (2003). *Math sense: algebra and geometry*. New York, NY: New Readers Press.

Learning Outcomes

The intent is for a student to be able to:

1. Demonstrate competence in the use of signed numbers, equation solving, word problem solving, the use and manipulation of exponents and roots, and polynomials.

Learning PACT Skills that will be DEVELOPED and/or 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 application problems, the student will identify and define problems, gather information and determine its relevancy, develop workable solutions, select and communicate the best solution.

Major Summative Assessment Task(s)

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

1. Completing a project involving the use of basic algebra concepts.

Course Content

- I. Skills/Competencies - Actions that are essential to achieve the course outcomes:
 - A. Concept of positive and negative numbers
 - B. Adding, subtracting, multiplying and dividing signed numbers
 - C. Using more than one operation to find and answer
 - D. Variables
 - E. Evaluating algebraic expressions

- F. Solving equations with one and two inverse operations
- G. Combining like variables
- H. Combining variables to solve equations
- I. Solving equations with variables on both sides
- J. Solving literal equations
- K. Using formulas to solve problems
- L. Writing equations to solve word problems
- M. Ratios and proportions including multi-step problems
- N. Factors, exponents, square roots, terms
- O. Adding, subtracting, multiplying and dividing monomials
- P. Adding polynomials together
- Q. Finding factors in terms with variables
- R. Multiplying the sum and difference of two numbers
- II. Themes - Key recurring concepts that run throughout this course:
 - A. Problem solving – use of multiple routes to reach a correct answer
 - B. Value of math – personal perceptions and others’ perceptions
 - C. Planning
- III. Issues - Key areas of conflict that must be understood to achieve the intended outcome:
 - A. Use of calculators
 - B. Relevance of algebra
 - C. Variability of order of methods used to come to correct answer
- IV. Concepts - Key concepts that must be understood to address the issues:
 - A. Math as a language
 - B. Properties that govern math usage

Learning Units

- I. Signed numbers
- II. Solving equations
- III. Word problems in algebra
- IV. Exponents, roots and polynomials

Learning Activities

Learning activities will be assigned to assist the student to achieve the intended course outcome through student-Instructor interaction, text materials, computerized instruction, web resources and other activities at the discretion of the instructor.

Grade Determination

The student will be graded on learning activities and assessment tasks (including development of visual representations in problem-solving). Grade determinates may include the following: daily assignments, including assignments involving use of study skills (i.e., making of unique study cards), and other methods of evaluation employed at the discretion of the instructor.