Northern Marianas College
CURRICULUM ACTION REQUEST

Course: MA089 Pre-Algebra

Effective Semester / Session: Spring 2022

Type of Action:

___	New
X	Modification
___	Move to Inactive (Stop Out)
___	Cancellation

Course Alpha and Number: MA089

Course Title: Pre-Algebra

Reason for initiating, revising, or canceling:
This course guide is being modified to reflect changes in the student learning outcomes.

Kathleen Winkfield 01.25.22

Proposer Date

Velma C. De Leon Guerrero 1/25/2022

Department Chair Date

Adam Walsh 01.24.22

Language & Format Review Specialist Date

Ajani Burrell 1.24.2022

Academic Council Chair Date

Vilma S. Reyes 1/25/22

Interim-Dean of Academic Programs and Services Date

1. **Department**
   Science, Mathematics, Health & Athletics

2. **Purpose**
   This course covers concepts of arithmetic and fundamental concepts of algebra. This course is designed to assist those students who need to improve their mathematical skills so that they can be placed in college-level mathematics courses.

   The need for this course was further demonstrated by the last 10 years of data from NMC's mathematics placement tests that show approximately 90% of all incoming students place at the Developmental Math.

3. **Description**
   In paragraph form, give the course description.

   A. Required/Recommended Textbook(s) and Related Materials
   Required:
   Aufmann, Richard N. and Joann S. Lockwood, *Prealgebra*, An applied Approach, 6th ed. Belmont, CA: Brooks/Cole, Cengage Learning, 2014.

   Recommended: None

   B. Contact Hours
   1. **Lecture:** 3 per week / 3 per semester
   2. **Lab:** None
   3. **Other:** None

   C. Credits
   1. **Number:** 3
   2. **Type:** Non-Degree Units

   D. Catalogue Course Description
   Note: MA087, MA089, and MA091 are preparatory courses in mathematics and do not carry college degree credit (i.e., NDU = non-degree units).

   This pre-algebra course covers variables and expressions with variables; monomials, binomials, and polynomials; exponents; first-degree equations with one variable and with two variables; the metric system and the U.S. system of measurement; ratios, rates, proportions, and percents; basic geometry. This course is designed to assist those students who need to upgrade their basic math skills so that they can be successful in subsequent mathematics courses. Prerequisite: BE111 or concurrent enrollment in EN085, MA087. (Offered Fall, Spring, and Summer)

E. Degree or Certificate Requirements Met by Course
None. A passing grade in this course satisfies only the mathematics proficiency requirement for entry into MA091 Beginning Algebra.

F. Course Activities and Design
Course activities include: lecture, class discussions, group work, homework assignments, viewing audio-visual materials, calculator exploration, quizzes, tests, and a final exam.

4. Course Prerequisite(s); Concurrent Course Enrollment
Prerequisites: BE111
Concurrent Course Enrollment: EN085 & MA087

Required English/Mathematics Proficiency Level(s)
English Placement Level: EN095
Mathematics Placement Level: MA089

5. Estimated Cost of Course; Instructional Resources Needed
Cost to the Student: Tuition for a 3-credit course, cost of textbook, cost of graphing calculator (optional), and the student activities fee.

Cost to the College: Instructor's salary.

Instructional resources needed for this course include: white board and white board markers, and as available, the use of audiovisual equipment, ELMO projector.

6. Method of Evaluation
Students will be evaluated by their performance on the chapter quizzes, homework, tests as well as a final exam. NMC's grading and attendance policies will be followed.

7. Course Outline

This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

1.0 Expressions with Variables
- 1.1 Properties of real numbers
- 1.2 Simplifying and evaluating expressions containing variables
- 1.3 Addition and subtraction of polynomials
- 1.4 Multiplication of monomials
- 1.5 Powers of monomials (exponential expressions)
- 1.6 Multiplication of polynomials
  - 1.6.1 Multiplication of a polynomial by a monomial
  - 1.6.2 Multiplication of two binomials, and the FOIL method
- 1.7 Division of monomials
- 1.8 Scientific notation
- 1.9 Verbal expressions and expressions containing variables

2.0 First-Degree Equations
- 2.1 First-Degree equations with one variable
- 2.2 First-Degree equations with one variable and parentheses
- 2.3 Translating sentences into equations, and solving the equations
- 2.4 The rectangular coordinate system
- 2.5 Graphs of linear equations in two variables (straight lines)

3.0 Measurement and Proportion
- 3.1 The metric system of measurement
- 3.2 Ratios and rates
- 3.3 The U.S. system of measurement
- 3.4 Converting between the U.S. system of measurement and the metric system
- 3.5 Proportions

4.0 Percent
- 4.1 Converting percents to fractions, and percents to decimals
- 4.2 Converting fractions to percents, and decimals to percents
- 4.3 Solving the basic percent equation
- 4.4 Solving percent problems using proportions
- 4.5 Percent increase and percent decrease
- 4.6 Price markups and discounts (price markdowns)
- 4.7 Simple interest, and the simple interest formula

5.0 Geometry
- 5.1 Definitions of basic geometric concepts
  - 5.1.1 Basic geometric concepts involving lines: point, line, and line segment
  - 5.1.2 Basic geometric concepts involving angles: ray, angle, vertex, right angle, acute angle, obtuse angle
- 5.2 Plane geometric figures
  - 5.2.1 Perimeter and circumference
  - 5.2.2 Area
- 5.3 Triangles
  - 5.3.1 The Pythagorean theorem
  - 5.3.2 Similar triangles

8. Instructional Goals

The course will introduce students to:

1.0 Properties of Real Numbers;

2.0 Simplifying and Evaluating Expressions Containing Variables;

3.0 Performing Mathematical Operations on Monomials, Binomials, and Polynomials;

4.0 Scientific Notation;

5.0 First-Degree Equation;

6.0 The Rectangular Coordinate System;

7.0 Graphing Linear Equations in Two Variables;

8.0 The Metric System of Measurement;

9.0 The U.S. System of Measurement;

10.0 Ratios, Rates, and Proportions;

11.0 Percents, Fractions, and Decimals;

12.0 Equations and Word Problems Involving Percents;

13.0 Definitions of Basic Geometric Concepts Involving Lines and Angles;

14.0 The Perimeter, Circumference, and Area of Plan Geometric Figures;

15.0 The Pythagorean Theorem; and

16.0 Similar Triangles.

9. Student Learning Outcomes

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

1.0 Simplify and evaluate expressions containing variables;

2.0 Perform mathematical operations on monomials, binomials, and polynomials;

3.0 Solve first-degree equations in one variable;

4.0 Find ordered-pair solutions to linear equations in two variables;

5.0 Graph linear equations in two variables;

6.0 Convert units between the U.S. system of measurement and the metric system;

7.0 Solve proportion problems, equations and written word problems involving percentages;

8.0 Convert percentages to fractions and percentages to decimals, fractions, and decimals to percentages;

9.0 Find the perimeter, circumference, and area of plane geometric figures;

10.0 Use the Pythagorean theorem to find the unknown side of a right triangle; and

11.0 Solve problems involving similar triangles.

10. Assessment Measures of Student Learning Outcomes

Assessment of student learning may include, but not be limited to, the following:

1.0 Homework;

2.0 Assignments;

3.0 Tests;

4.0 Quizzes; and

5.0 Final Exam.