

Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: Fall 2010

Type of Action:

- New
- Modification
- Move to Inactive (Stop Out)
- Cancellation

Course Alpha and Number: MA 087

Course Title: Fundamentals of Mathematics

Reason for initiating, revising, or canceling:

This course replaces MA 088 Basic Mathematics. In relation to the course guide for MA 088, this course guide for MA 087 reflects changes in the course number and course title of the course, the course number and course title of the prerequisite, the textbook, the number of the course NDU credits, the catalogue course description, the course activities and design, the course outline, the instructional goals, and the student learning outcomes, and the addition of a LAB requirement of two hours per week in the classroom.

Frank Sobolewski July 1, 2010

Proposer

Date

[Signature]

7.1.10

Department Chair

Date

[Signature]

7.1.10

Dean of Academic Programs and Services

Date

Northern Marianas College

Course Guide

Course: MA 087 Fundamentals of Mathematics

1. Department

Sciences, Mathematics, Health, and Athletics

2. Purpose

The purpose of this course is to help students develop and improve their basic arithmetic skills. The course will introduce, explore, and apply concepts of introductory mathematics (including integers, fractions, decimals, and exponents) essential for preparing students for the successful completion of subsequent math courses required for graduation from NMC. This course will also help students enhance their self-concept with regard to their mathematical ability.

The need is also demonstrated by the compiled results of NMC's mathematics placement tests showing that approximately 30 to 40 percent of all incoming students score 40% or lower on the MA 089 (formerly MA 090) Placement Test. This low score indicates that the student needs a review of basic arithmetic skills. MA 087 offers students the necessary foundation to successfully complete MA 089 and MA 091.

3. Description

A. Required/Recommended Textbook(s) and Related Materials

Required Textbook:

Aufmann, Richard N., Vernon C. Barker, and Joann S. Lockwood, *Prealgebra*, 5th ed. Belmont, CA: Brooks/Cole, Cengage Learning, 2009.

Readability level: Grade 8.3

B. Contact Hours

1. **Lecture:** 2 hours per week / 30 hours per semester
2. **Lab:** 2 hours per week / 30 hours per semester
3. **Other:**

C. Credits

1. **Number:** 3
2. **Type:** NDU (Non-degree units)

D. Catalogue Course Description

Note: MA 087, MA 089, and MA 091 are preparatory courses in mathematics and do not carry college degree credit (i.e., NDU = non-degree units).

Northern Marianas College

Course Guide

Course: MA 087 Fundamentals of Mathematics

This course covers basic concepts of arithmetic, including integers, fractions, decimals, and exponents. This course is designed to assist students who need to upgrade their basic math skills so that they can be successful in subsequent mathematics courses. Prerequisite: BE 111 College Success, or concurrent enrollment. English Placement Level: EN 093/094. Math Placement Level: MA 087. (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 MA 089 Pre-Algebra.

F. Course Activities and Design

Course activities include lecture, group work, peer teaching, discussions, homework assignments, viewing audio-visual materials, lab work in the classroom, quizzes, tests, and an exit exam.

4. Course Prerequisite(s); Concurrent Course Enrollment; Required English/Mathematics Placement Level(s)

Prerequisite: BE 111 College Success, or concurrent enrollment.

English Placement Level: EN 093/094

Math Placement Level: MA 087 (40% or lower on the MA 089 Placement Test)

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a 3-credit course, cost of textbook, and the student activities fee.

Cost to the College: Instructor's salary.

Instructional resources needed for this course include chalk and chalkboard, an ELMO projector, and a TV/VCR.

6. Method of Evaluation

Successful completion of this course requires a score of 70% or higher on the exit exam. Only P (Pass) or NP (No Pass) or TF (Technical Failure) grades are given in this NDU course. TF is assigned only for excessive absences, i.e., more than 9 hours absent. NMC's grading and attendance policies and the Sciences, Math, Health and Athletics Department's attendance policies will be followed.

Northern Marianas College

Course Guide

Course: MA 087 Fundamentals of Mathematics

7. Course Outline

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

- 1.0 Working with Whole Numbers
 - 1.1 Whole Numbers and Place Value; Reading Tables and Numbers
 - 1.2 Addition and Subtraction of Whole Numbers; Estimation
 - 1.3 Multiplication of Whole Numbers; the Laws of Addition and Multiplication
 - 1.4 Division of Whole Numbers, Quotients, and Remainders; Divisibility
 - 1.5 Prime Numbers, Factor Trees, and Prime Factorization
 - 1.6 Solving Equations with Whole Numbers and One Variable

- 2.0 Whole Numbers and Their Negatives
 - 2.1 The Number Line, Integers, Opposites, Absolute Value, Bar Charts
 - 2.2 Inequality Symbols; Comparison of Integers
 - 2.3 Addition of Positive and Negative Numbers
 - 2.4 Subtraction of Positive and Negative Numbers; Applications
 - 2.5 Multiplication and Division of Positive and Negative Numbers
 - 2.6 Solving Equations with Integers and One Variable
 - 2.7 Order of Operations, and Use of Parentheses

- 3.0 Fractions and Exponents
 - 3.1 Least Common Multiple and Greatest Common Factor (Divisor)
 - 3.2 Signed Fractions, Lowest Terms, Improper Fractions, and Mixed Numbers
 - 3.3 Multiplying and Dividing Fractions; Reciprocals; Order of Operations
 - 3.4 Adding and Subtracting Fractions; Order of Operations
 - 3.5 Solving Equations with Fractions and One Variable
 - 3.6 Exponents
 - 3.7 Exponents and the Order of Operations
 - 3.8 Complex Fractions

- 4.0 Decimals and Real Numbers
 - 4.1 Place Value of Decimals
 - 4.2 Converting Fractions to Decimals and Decimals to Fractions
 - 4.3 Rounding of Decimals
 - 4.4 Addition and Subtraction of Decimals

Northern Marianas College

Course Guide

Course: MA 087 Fundamentals of Mathematics

- 4.5 Multiplication and Division of Decimals
- 4.6 Solving Equations with Decimals and One Variable
- 4.7 Square Roots
- 4.8 Real Numbers and the Real Number Line
- 4.9 Inequalities in one Variable

8. Instructional Goals

This course will introduce students to:

- 1.0 Reading and writing whole numbers;
- 2.0 Operations with whole numbers;
- 3.0 Prime numbers, factor trees, and prime factorization;
- 4.0 Comparison of integers, opposites, absolute value, and inequality symbols;
- 5.0 Operations with positive and negative numbers;
- 6.0 Order of operations with parentheses;
- 7.0 Least Common Multiples and Greatest Common Factors (Divisors);
- 8.0 Operations with fractions;
- 9.0 Solving equations with one variable;
- 10.0 Evaluating expressions with variables;
- 11.0 Simplifying and evaluating expressions with integers, fractions, and exponents;
- 12.0 Simplifying complex fractions;
- 13.0 Decimals, and their equivalent value in fractions;
- 14.0 Operations with decimals; and
- 15.0 Square Roots.

Northern Marianas College

Course Guide

Course: MA 087 Fundamentals of Mathematics

9. Student Learning Outcomes

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

- 1.0 Read and write whole numbers;
- 2.0 Perform mathematical operations using whole numbers;
- 3.0 Construct factor trees and perform prime factorization on whole numbers;
- 4.0 Define integers, opposites, absolute value, and inequality symbols;
- 5.0 Perform mathematical operations with positive and negative numbers;
- 6.0 Evaluate expressions using the order of operations;
- 7.0 Find Least Common Multiples and Greatest Common Factors;
- 8.0 Perform mathematical operations with fractions;
- 9.0 Solve equations with one variable;
- 10.0 Evaluate expressions with variables;
- 11.0 Simplify and evaluate expressions with integers, fractions, and exponents;
- 12.0 Simplify complex fractions;
- 13.0 Convert fractions to decimals, and decimals to fractions;
- 14.0 Perform mathematical operations using decimals; and
- 15.0 Perform mathematical operations using square roots.

Northern Marianas College

Course Guide

Course: MA 087 Fundamentals of Mathematics

10. Assessment Measures

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

- 1.0 Students must complete tests, quizzes, and assignments. They must also attend class regularly, participate in classroom discussions and activities, and do lab work; and
- 2.0 Periodic testing and a final comprehensive examination (the Exit Exam) to evaluate the students' knowledge and abilities in cognitive reasoning and in the identification, interpretation, comprehension, calculation, and application of basic arithmetic concepts.