Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: **Spring 2012**

Type of Action:

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

Course Alpha and Number: MA 161

Course Title: College Algebra

Reason for initiating, revising, or canceling:
This course guide is being modified to reflect the change in the edition of the text book.

MR. ERIC JOHNSON

2-8-12

Proposer Date

DR. ALFREDO DE TORRES 8 Feb 12

Department Chair Date

for MS BARBARA MERFALEN 2-9-12

Dean of Academic Programs and Services Date

Northern Marianas College
Course Guide

Course: MA 161 College Algebra

1. **Department**
   Sciences, Mathematics, Health and Athletics

2. **Purpose**
   The purpose of this course is to enable students to (1) develop proficiency in college algebra, (2) offer a college-level mathematics course that will be sufficient for many Associate and Bachelor degree programs, (3) prepare those students who are interested in taking a calculus course.

3. **Description**

   A. **Required/Recommended Textbook(s) and Related Materials**
   Required:
   Aufman, Richard N., et. al. *College Algebra*. 6th ed. Boston, MA: Houghton Mifflin Company, 2008.
   Readability level: Grade 12

   Required calculator: TI-82/83/89 or equivalent graphing calculator.

   B. **Contact Hours**
      1. **Lecture:** 4 hours per week / 60 per semester
      2. **Lab:**
      3. **Other:**

   C. **Credits**
      1. **Number:** 4
      2. **Type:** Regular degree units

   D. **Catalogue Course Description**
   This course focuses on the theories and applications of algebraic, exponential, and logarithmic functions. Numerical, algebraic, and graphical techniques are emphasized throughout, both in the presentation of concepts and in solving problems. Prerequisites: C or better in MA 132 or MA 161 placement. English Placement Level: EN 093/094. Math Placement Level: MA 161. (Offered Fall, Spring, and Summer)

   E. **Degree or Certificate Requirements Met by Course**
   MA 161 meets a core course requirement for all degrees at NMC.

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F. Course Activities and Design
Course activities include lecture, discussions, homework assignments, tests, quizzes, and a comprehensive final exam.

4. Course Prerequisite(s); Concurrent Course Enrollment; Required English/Mathematics Placement Level(s)
Prerequisites: C or better in MA 132 or MA 161 placement
English Placement Level: EN 093/094
Math Placement Level: MA 161

5. Estimated Cost of Course; Instructional Resources Needed
Cost to the Student: Tuition for a 4-credit course; cost of textbook; cost of a TI-82/83/89 graphics calculator; and instructional materials fee.

Cost to the College: Instructor's salary.

Instructional resources needed for this course include: A classroom equipped with chalk and chalkboard, or whiteboard, and erasers. An electronic projection device and television or other viewing device for calculator demonstrations. A TI-82/83/89 graphics calculator with a manual and instructor's edition textbook with supplemental materials.

6. Method of Evaluation
Student grades will be based on the regular letter grade system as described below:

A: Excellent – grade points: 4.0;
B: Above average – grade points: 3.0;
C: Average – grade points: 2.0;
D: Below average – grade points: 1.0;
F: Failure – grade points: 0.0.

NMC's grading and attendance policies will be followed.

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7. Course Outline

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

1.0 Equations and Inequalities
- 1.1 Linear equations
- 1.2 Formulas and applications
- 1.3 Quadratic functions
- 1.4 Other types of functions
- 1.5 Inequalities
- 1.6 Variation and applications

2.0 Functions and Graphs
- 2.1 A two-dimensional coordinate system and graphs
- 2.2 Introduction to functions
- 2.3 Linear functions
- 2.4 Quadratic functions
- 2.5 Properties of graphs
- 2.6 The algebra of functions
- 2.7 Modeling data using regression

3.0 Polynomial and Rational Functions
- 3.1 Polynomial division and synthetic division
- 3.2 Polynomial functions
- 3.3 Zeros of polynomial functions
- 3.4 The fundamental theorem of algebra
- 3.5 Rational functions and their graphs

4.0 Exponential and Logarithmic Functions
- 4.1 Inverse functions
- 4.2 Exponential functions and their graphs
- 4.3 Logarithmic functions and their graphs
- 4.4 Properties of logarithmic
- 4.5 Exponential and logarithmic equations
- 4.6 Applications of exponential and logarithmic functions
- 4.7 Modeling data with exponential and logarithmic functions

5.0 Topics in Analytic Geometry
- 5.1 Parabolas
- 5.2 Ellipses
- 5.3 Hyperbolas

6.0 Systems of Equations
- 6.1 Systems of linear equation in two variables
- 6.2 Systems of linear equations in more than two variables
- 6.3 Nonlinear systems of equations
- 6.4 Partial fractions
- 6.5 Inequalities in two variables and systems of inequalities
- 6.6 Linear programming

8. Instructional Goals

This course will introduce students to:

1.0 Equations and inequalities;

2.0 Functions and graphs;

3.0 Polynomial and rational functions;

4.0 Exponential and logarithmic functions;

5.0 Topics in analytic geometry; and

6.0 Systems of equations.

9. Student Learning Outcomes

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

1.0 Evaluate linear, quadratic, and other types of equations and inequalities, and applications of these;

2.0 Graph linear, quadratic, and other functions in two dimensions as well as finding the critical points of these graphs;

3.0 Find real and imaginary zeros from higher degree polynomials using the Remainder Theorem, Factor Theorem, and Fundamental Theorem of Algebra and to apply these in applications;

4.0 Find and prove inverse functions and apply exponential functions, logarithmic functions, and modeling data using these functions;

5.0 Find equations and graph conic sections as well as calculating centers, vertices, foci, asymptotes, eccentricities, and intercepts; and

6.0 Graph and solve systems of linear equations with two or more variables, nonlinear inequality systems, partial fractions, and linear programming.

10. Assessment Measures

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

Regular quizzes, chapter testing, homework, and a final comprehensive examination to evaluate the student's knowledge and abilities in cognitive reasoning and the interpretation, identification, comprehension, calculation and application of the concepts of college algebra.