

Northern Marianas College

CURRICULUM ACTION REQUEST

Course: MA161 College Algebra

Effective Semester / Session: Fall/Spring YEAR

Type of Action:

- New
 Modification
 Move to Inactive (Stop Out)
 Cancellation

Course Alpha and Number: MA161

Course Title: College Algebra

Reason for initiating, revising, or canceling:

Textbook edition and updates needed over time.

Eric W. Johnson

EWJ



1-24-22

Proposer

Date

Velma C. Deleon Guerrero



1/24/2022

Department Chair

Date

Adam Walsh



01.24.22

Language & Format Review Specialist

Date

Ajani Burrell

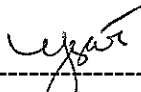


1.24.2022

Academic Council Chair

Date

Vilma S. Reyes



1/25/22

Interim-Dean of Academic Programs and Services

Date

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Course Guide

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Course: MA161 College Algebra

1. Department

Science, Mathematics, Health & 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, and (3) prepare those students who are interested in taking a calculus course.

3. Description

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

Required:

Aufman, Nation, *College Algebra* (8th Edition). Cengage. ISBN-13: 978-1-285-43477-3

Recommended: None

B. Contact Hours

1. **Lecture:** 4 per week / 60 per semester
2. **Lab:** None
3. **Other:** None

C. Credits

1. **Number:** 4
2. **Type:** Regular Degree Credits

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. A TI-82/83/89 graphic calculator is required. Prerequisites: MA132 (Offered Fall, Spring and Summer).

E. Degree or Certificate Requirements Met by Course

MA161 meets the Math core course requirement for all degrees at NMC.

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

Prerequisites: MA132

Concurrent Course Enrollment: None

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Required English/Mathematics Proficiency Level(s)

English Placement Level: EN095

Mathematics Placement Level: MA161

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: classroom equipped with whiteboard, markers, and eraser; an electronic projection device and television or other viewing device for calculator demonstrations; TI-82/83/89 graphics calculator w/ manual, and instructor's edition textbook w/ supplemental materials.

6. Method of Evaluation

Students will be evaluated by their performance on the chapter quizzes, homework, and tests, as well as the completion of the final exam. 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 the graphs
- 4.3 Logarithmic functions and their graphs
- 4.4 Properties of logarithms
- 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

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- 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

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8. Instructional Goals

The 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 and Analytic Geometry; and
- 6.0 Systems of Equations.

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9. Student Learning Outcomes

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

- 1.0 Solve and apply linear, quadratic, and other types of equations and inequalities;
- 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;
- 4.0 Prove inverse functions and apply exponential functions, logarithmic functions, and modeling data using these functions;
- 5.0 Find equations to 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 of Student Learning Outcomes

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

- 1.0 Quizzes;
- 2.0 Tests;
- 3.0 Homework; and
- 4.0 Final Comprehensive Examination.