MA104
College Algebra with Applications in Science and Technology

Fall 2015
MA104 Syllabus

Class Meeting Hours
• Monday, Tuesday, Wednesday, Thursday
• Classroom: West Science 3602

Instructor
• Roxin Zhang, New Jamrich 2208
• rzhang@nmu.edu
• Office Hours: MWRF 11am – 11:50 am and any time by appointments

Computer and Calculator Requirements
• A computer with TI InterActive
• A scientific calculator is needed for day-to-day work
Prerequisite

- A C- or better from MA100 or Recommendation from NMU Math Placement

Text Book

- College Algebra & Trigonometry, 6E
  by M. Levitan, B. Kolman, A. Shapiro

Tests and Quizzes

- 5-6 Biweekly Quizzes (drop one lowest quiz)
- One Midterm (possible multiple choice)
- One final exam (possible multiple choice), check with the NMU websites for final exam schedules.
Grading (Weighted average)

- Quizzes and Projects  50%
- Midterm               20%
- Final Exam            25%
- Attendance            5%

The grade is given based on the weighted average of the above:
A 95%, A- 90%, B+ 85%, B 80%, B- 75%, C+ 70%, C 65%, C- 60%, D+55% etc.

Homework

- Homework will be assigned daily and you must work on the assigned problems to understand the concepts. Homework will not be graded.
Learning Outcomes

Upon successful completion of this course the student will be able to:

• Understand and apply the rules of linear, quadratic, polynomial, exponential, and logarithmic relations to solve equations.

• Understand and apply the concepts and properties of a function to model real-world situations, and solve scenarios involving these functions.

• Apply trigonometry to solve problems involving triangle relationships.

• Use calculators to set up and solve problems using graphs, tables, and formulas.

• Evaluation of these learning outcomes will be done through assignments and exams.
Liberal Studies Requirement

This course satisfies the Division III, Foundations of Natural Sciences, of the Liberal Studies requirement.

Students elect a minimum of six credits from this division. Students who complete the science courses should be able to recognize and understand the scientific method; understand and use scientific concepts; understand and discuss general scientific articles; and apply their knowledge of science to everyday experience. Students who complete the mathematics courses should be able to demonstrate a basic understanding of mathematical logic; use mathematics to solve scientific or mathematical problems in college classes; express relationships in the symbolic language of mathematics; and appreciate the role of mathematics in analyzing natural phenomena.
DISABILITY SERVICES

• If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Disability Services Office by: coming into the office at 2001 C. B. Hedgcock; calling 227-1700; or e-mailing disserv@nmu.edu.

• Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.
What is Algebra? Why do we need it?

One example. Thomas has 3 more apples than Jennifer. After Jennifer gives away 2 apples to her brother (not Thomas), Thomas and Jennifer will have a total of 13 apples. How many apples does each of them have?

Algebra: Thomas has $x$ apples, Jennifer has $y$ apples, and we have the equations:

$$x = y + 3$$

$$x + (y - 2) = 13$$

Algebra is the language of mathematics to solve problems in real life.
Contents

1. Basic Concepts and Properties
   Sets, real Numbers, expressions

2. Equations and Inequalities
   Linear and fractional equations, inequalities

3. Polynomials
   Properties of polynomials, factoring polynomials

4. Rational Expressions
   Dealing with rational and fractional expressions
Contents

5. Exponents and Radicals
   Exponential and radical expressions, quotients and roots

6. Quadratic Equations and Inequalities
   Quadratic equations, completing squares, complex numbers

7. Two Dimensional Coordinates
   Rectangular coordinates, distances, equations of lines

8. Functions
   Concepts of functions, linear and quadratic functions, transforming and combing functions
9. Polynomial and Rational Functions
   Dividing polynomials, remainder and factor theorem, graphing polynomial and rational functions

10. Exponential and Logarithmic Functions
    Exponential expressions and functions, logarithmic expressions and functions

11. System of Equations
    Solving several linear equations, matrices and determinants

12. Algebra of Matrices
    Matrix expressions