



College Algebra (MTH999)



MTH 999: "College Algebra"

Fall 2019 Course Syllabus

Grading: Letter Grade - 3 units

Mon & Friday: Block 4 in 513

OFFICE HOURS: Monday & Thursday: 3:30 – 4:30 pm.

Instructor: Ava Dornbush

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COURSE DESCRIPTION:

MTH 0999: "Algebra in a Practical Context"

Study of various topics in algebra including, but not limited to: properties of REAL NUMBERS, LINEAR EQUATIONS, INEQUALITIES, POLYNOMIALS, RATIONAL EXPRESSIONS, EXPONENTS and ROOTS, QUADRATIC EQUATIONS, SYSTEMS OF LINEAR EQUATIONS, and APPLICATIONS of algebra to real world problems.

PREREQUISITES: None.

COURSE OBJECTIVES:

Students will develop math skills that are used in mathematical problem solving and mathematical modeling. These strategies are used in business, psychology, sociology, environmental studies, and in many other disciplines where problem solving is needed. Upon successful completion of this course, students will be mathematically prepared for their upcoming math courses, i.e., College Algebra and Introductory Statistics. This goal and the skills developed support the University Mission and Vision Statements that call for students to be able to communicate quantitatively, and to be problem solvers.

COURSE OUTCOMES:

- Successfully use math operators with REAL NUMBERS
- Use ORDER OF OPERATIONS to simplify expressions
- Use the three MATH PROPERTIES: ASSOCIATIVITY, COMMUTATIVITY and DISTRIBUTIVITY
- EVALUATE mathematical EXPRESSIONS
- Solve LINEAR EQUATIONS in one and two variables
- Solve SYSTEMS OF LINEAR EQUATIONS AND LINEAR INEQUALITIES
- FACTOR QUADRATIC EQUATIONS
- Solve OPERATIONS with POLYNOMIALS
- Graph LINEAR and QUADRATIC EQUATIONS
- Solve OPERATIONS with RATIONAL EXPRESSIONS
- Learn to FACTOR
- Develop analytical and critical thinking skills
- Solve real world problems
- Build personal math skills confidence

Required Textbook: *We will use resources provided in class.*

Student Expectations: You will need a calculator that has y^x , e^x , *log* and *ln* functions (most computers have this calculator) and plenty of notepaper. Homework will be assigned weekly. Individual and group work may be assigned. **Ask questions if you don't understand! Math concepts can be explained in several different ways!**

Grading: Credit: 3 units. Grading will be approximately as follows:

Homework: 20%

Quizzes: 25%

Midterms: 25%

Final Exam: 25%

Participation: 5%

Grading: 100% - 90% = A, 89% - 80% = B, 79% - 70% = C, 69% - 60% = D, less than 60% = F.

Weekly quizzes will be based on the homework assignments.

Class Policies: Non-attendance is the main reason people fail this class, so come to class on time. Cheating will be dealt with harshly- **so don't!** Respect others. All of Alliant International University's student policies will apply in our classroom. ***Please silence all digital devices and do not use them in class – NO TEXTING, FACEBOOKING, or anything that will distract student attention.***

Non-Classroom Learning Resources: Online resources – khanacademy.com, YouTube, others. Please contact the instructor for a list of free algebra websites. Please exchange thoughts and ideas with fellow students, and form study groups.

Word from the Teacher: I love math and I want students to enjoy their math experience, to appreciate math for its artistic qualities. Teacher reserves the right to change this syllabus at any time and students will be notified in the classroom, on this course's Canvas site, or by email.

Class Schedule: Class sessions are every Monday and Friday during 1st or 2nd block in room **513**. Each week will have 3 hours of lecture. Students will be notified when additional work will be required in the classroom, on this course's Canvas site, or by email

Homework: Assignments will be given weekly in class and listed in our online Canvas course, to be collected every Monday for the previous week. Additional homework, depending upon individual math skill level, may be suggested, as instructor deems necessary. Homework will not be checked for accuracy but will be checked for completion. Weekly quizzes will be based on homework assignments.

This course adheres to the policies outlined in the Alliant International University catalogue. For further information, see the Academic Policies stated in the catalogue.

Homework Assignment Topics (Handouts given in class/Posted Online)

Week 1

- Log onto Alliant MTH0999 Canvas course
- Familiarize with syllabus and other resources

Ch 1- Real Numbers

- Properties of the Real Numbers
- Adding and Subtracting Integers
- Multiplying and Dividing Integers
- Exponents
- Order of Operations

Week 2

Ch 2 – Decimals

- Properties of the Decimals
- Adding and Subtracting Integers
- Multiplying and Dividing Integers
- Scientific Notation

Ch 3 – Number Theory

- Factors and Multiples
- Divisibility Tests
- Greatest Common Factor (GCF)
- Least Common Multiple (LCM)
- Sequences and Number Patterns

Week 3

Ch 4 – Fractions

- Properties of Fractions
- Fractions and Decimals
- Adding and Subtracting Fractions
- Multiplying and Dividing Fractions

Week 4

- Practice Midterm #1 Review (Chs 1- 4)
- **Midterm #1**

Week 5

Ch 5 –Ratios, Proportions, and Percents

- Ratios and Rates
- Proportions
- Percents
- Percents and Decimals
- Percents and Fractions
- Percents and Applications

Week 6

Ch 6 – Equations

- Variables and Expressions
- Adding and Subtracting Expressions
- Multiplying and Dividing Expressions
- Solving One-step Equations
- Solving Two-step Equations
- Solving Multi-step Equations
- Translating Word Problems into Symbols
- Solving Word Problems in One Variable
- Literal Equations and Formulas

Week 7

Ch 7 – Functions and Graphs

- Number Line and Coordinate Plane
- Linear Equations
- Equations and Functions
- Relations and Functions
- Graphing Linear Equations
- Slope
- Finding the Equation of a Line
- Parallel and Perpendicular Lines
- Direct Variations

Week 8

- Practice Midterm #2 (Week 5-7 material)
- **Midterm Exam #2**

Week 9

Ch 8 – Polynomials and Factoring

- Laws of Exponents
- Multiplying Polynomials
- Multiplying Binomials (FOIL)
- Factoring Polynomials
- Factoring Quadratic Trinomials
- Factoring Special Quadratic Trinomials
- Solving Equations by Factoring
- Word Problems

Week 10

Ch 9 – Inequalities and Absolute values

- Inequalities on the Number Line
- Solving Inequalities in One Variable
- Solving Combined Inequalities
- Word Problems
- Operations with Absolute Values
- Absolute Value Equations and Inequalities

Week 11

Ch 10 – Systems of Equations and Inequalities

- Consistent, inconsistent, dependent, independent (definitions)
- Solving systems by graphing
- Solving systems by substitution and elimination
- Word Problems

Week 12

- Practice Midterm #3
- **Midterm Exam #3**

Week 13

Ch 11 – Roots and Radicals

- Square Roots and Radicals
- Simplifying Radicals
- Simplifying Radical Expressions
- Solving Radical Equations
- The Pythagorean Theorem
- Distance and Midpoint Formulas

Week 14

Ch 12 – Quadratic Equations and Functions

- Quadratic Equations with Perfect Squares
- Completing the Square
- The Quadratic Formula
- Graphing Quadratic Functions - Parabolas

Week 15

Ch 13 – Rational Expressions

- Simplifying Rational Expressions
- Adding and Subtracting Rational Expressions
- Multiplying and Dividing Rational Expressions
- Solving Rational Equations
- Word Problems
- Inverse Variations

Week 16

- Practice Final Exam Review

Week 17

- Final Exam

