

# Essentials of Algebra II (4)

(Effective Spring 2019)

**Prerequisite:** C or better in Math 100.

**Catalog Description:** Functions and their graphs (including polynomial, rational, exponential, and logarithmic), exponents, roots, radicals, rational expressions, factoring polynomials, zeroes of polynomials, solutions of linear and nonlinear equations and inequalities, systems of equations and inequalities, matrices and determinants, inverse functions.

**Notes:**

1. This course requires the use of a graphing calculator. The department recommends a calculator of the TI-83, TI-84 series for this course. Computer algebra systems are prohibited. A TI-Nspire may only be used with a TI-84 faceplate.
2. Some instructors may require MyMathLab, a computer supplement to the course text. Students should check with their instructor before purchasing MyMathLab access.
3. All students in this course must sign up for both a lecture class and a lab class. This class will meet for 3 hours a week in lecture and 2 hours per week in lab. The student's grade will be a composite of the lecture grade and the lab grade with the lecture counting as 80% of the student's grade and the lab as 20% of the student's grade.
4. All students in this course will take the Department of Mathematics and Statistics common final exam.
5. Because of the sequencing of the labs, every instructor needs to adhere to the given schedule.

**Goal:** To prepare students for success in college courses, especially the sciences, by introducing algebra and requiring effective written communication and to motivate and illustrate these topics by relevant applications.

**General Education:** The faculty of UT Martin have included this as a general education course with the following course goal and student learning outcomes.

Curriculum Goals: The purpose of the Mathematics requirement is to teach students to organize, evaluate and solve problems using both abstract and quantitative approaches. Courses in this area will enable students to communicate using the language of mathematics.

Student Learning Outcomes:

- a. Students will use appropriate notation and vocabulary to communicate mathematics.
- b. Students will use symbolic and numerical methods to perform calculations.
- c. Students will solve problems with real-world applications.

**Teaching Objectives:** The student will:

1. Determine if the inverse of a function exists and relate the graphs of the function and its inverse.
2. Find the formula for the inverse of a one-to-one function.
3. Perform binary operations on functions.

4. Find the composite of two functions and determine its domain and image set.
5. Graph exponential and logarithmic functions.
6. Solve exponential and logarithmic equations.
7. Apply exponential and logarithmic functions to solve real-world problems.
8. Use technology to fit curves to points in the  $xy$ -plane.
9. Solve systems of equations and inequalities.
10. Evaluate and graph rational functions.
11. Solve equations and inequalities involving rational, root, power, and absolute value functions.
12. Graph a convex polygon to represent a given set of inequalities.
13. Determine the vertices of a convex polygon and use the vertices to maximize or minimize a function in two variables.
14. Calculate the sum and product of two matrices when defined.
15. Perform scalar multiplication.
16. Apply the inverse of a ( $2 \times 2$  or  $3 \times 3$ ) matrix to find the solution of  $\mathbf{Ax} = \mathbf{b}$ .

**Text(s):** Essentials of College Algebra, 12<sup>th</sup> Edition, Lial, Hornsby, Schneider, 2019, Addison Wesley, ISBN: 9780134675022

The text is required for all classes. Some instructors may also require MyMathLab.

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