COURSE OUTLINE

Course Number **MAT 044**	Course Title **Foundation Math for STEM**	Credits **3**
Hours: **Lecture/Lab/Other** **0/6**	**Co- or Pre-requisite** **No High School Algebra OR** **1 year High School Algebra**	**Implementation** **Semester & Year** **Spring 2022**

Catalog description: Developmental mathematics course designed for students needing an introduction to Intermediate Algebra. Topics include graphing linear equations in two variables, systems of two linear equations, rational expressions and equations, radicals and rational exponents, and linear and quadratic functions. Those who complete this course with a grade of C or better may register for MAT 146

[This course does not fulfill mathematics elective requirements.]

General Education Category:
Not GenEd

Course coordinator:
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Required texts & Other materials:

- ALEKS software: 18-week ALEKS360 access

- Calculator: Students must have a scientific calculator. A graphing calculator is recommended but not required for students who need to take additional mathematics courses. Students will not be able to use the calculator on a cell phone. A calculator with symbolic manipulation is also not allowed.

- Notebook

Course Student Learning Outcomes (SLO):

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

1. Solve and graph both linear and quadratic equations. [Supports ILG2,4,11]

2. Solve a system of two linear equations. [Supports ILG2,4,11]

3. Perform operations and solve equations involving rational expressions. [Supports ILG2,4,11]

4. Perform operations and solve equations involving radical expressions and rational exponents. [Supports ILG2,4,11]

5. Recognize and work with functions and function notation. [Supports ILG2,4,11]

6. Analyze graphs of polynomial functions. [Supports ILG2,4,11]

7. Solve quadratic inequalities. [Supports ILG2,4,11]

Course-specific Institutional Learning Goals (ILG):

Institutional Learning Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.
Institutional Learning Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.
Institutional Learning Goal 11. Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Units of study in detail – Unit Student Learning Outcomes:

Unit I   Graphing Linear Equations in Two Variables [Supports SLO 1]

The student will be able to:

- Read, interpret, and explain trends in graphs that model applications.
- Determine the relationship between slope and horizontal, vertical, parallel, and perpendicular lines.
- Define and graph linear equations in two variables.
- Express and graph linear equations in slope-intercept form.
- Use linear modeling to find the equation of a line through two given points, or a slope and y-intercept.
- Find equations of lines that are horizontal, vertical, and parallel/perpendicular to given lines.

Unit II   Systems of Two Linear Equations [Supports SLO 2]

The student will be able to:
- Solve systems of two linear equations having real number solutions, using a variety of methods, such as graphing and algebraic solving.
- Identify systems of two linear equations as consistent and inconsistent.
- Solve application problems that involve systems of two linear equations.

Unit III   Rational Expressions and Equations [Supports SLO 3]

The student will be able to:

- Define rational expressions and identify where they are undefined.
- Simplify rational expressions.
- Multiply and divide rational expressions.
- Find the LCD (Least Common Denominator) for given rational expressions.
- Add and subtract rational expressions.
- Simplify complex fractions.
- Solve rational equations.

Unit IV   Radicals and Rational Exponents [Supports SLO 4]

The student will be able to:

- Define and calculate square, cube, and nth root of a number.
- Calculate and/or simplify expressions with radicals or rational exponents.
- Add and subtract radical expressions.
- Multiply and divide radical expressions.
- Divide radical expressions.
- Solve radical equations.
- Define the imaginary number i and complex number $a + bi$.
- Add, subtract, multiply, and divide complex numbers.
- Define and solve quadratic equations with all solution types using a variety of solving methods.

Unit V   Functions: Linear and Quadratic [Supports SLO 5,6,7]

The student will be able to:

- Use the discriminant to find the number of real and complex solutions to a quadratic equation. (CG5, CG6, GE 2, Core B)
- Graph quadratic equations, identifying the vertex, axis of symmetry, and the maximum/minimum value attained by the function. (CG5, CG6, GE 2, Core B)
- Identify the domain and range of a quadratic function. (CG5, CG6, GE 2, Core B)
- Identify the domain and range of several types of functions. (CG5, CG5, GE 2, Core B)
- Solve quadratic inequalities. (CG5, CG7, GE 2, Core B)

Evaluation of student learning:

All course student-learning outcomes will be assessed by the following activities. Test questions will be selected to evenly assess all expected outcomes.

Grades will be assigned as detailed below:
- Attendance/Writing Assignments – 10%
- Unit Tests (5) – 30%
- Final Exam – 60%