MERCER
COUNTY COMMUNITY COLLEGE

COURSE OUTLINE

Course Number	**Course Title**	**Credits**
MAT 037	Beginning Algebra	4

Hours: **Lecture/Lab/Other**	**Co- or Pre-requisite**	**Implementation** **Semester & Year**
4/0/0	None	Spring 2022

Catalog description: Foundation mathematics course designed for students with experience in algebra but who need to strengthen their mastery of the fundamentals. Topics include exponents, polynomials, factoring, graphing first-degree equations, quadratic equations, rational expressions, and radical expressions. [Foundation course does not fulfill mathematics elective requirement.]

General Education Category:	**Course coordinator:**
Not GenEd	Elizabeth Carr, (609) 570-3409, email: carre@mccc.edu

Required texts & Other materials:
- Elementary Algebra 2nd ed., Marecek, Lynn, OpenStax.org
  https://openstax.org/details/books/elementary-algebra-2e
  Hardcover: ISBN-13: 978-1-975076-47-4
  Paperback: ISBN-13: 978-1-975076-46-7
  Digital: ISBN-13: 978-1-951693-20-6
- Scientific calculator

Course Student Learning Outcomes (SLO):
  Upon successful completion of this course the student will be able to:
  1. Develop a strategy for solving linear equations and inequalities. (ILG #2, 11)
  2. Generate graphs of linear equations with two unknowns to provide visual solutions for single equations. (ILG #2, 11)
  3. Synthesize the rules of exponents and polynomial operations to simplify algebraic expressions to a standard form. (ILG #2, 11)
  4. Distinguish polynomials in order to apply correct techniques of factoring. (ILG #2, 11)
  5. Adapt the techniques of factoring polynomials to solve quadratic equations. (ILG #2, 11)
  6. Apply the arithmetic operations of addition, subtraction, multiplication and division to both rational expressions and radical expressions. (ILG #2, 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 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 **Equations and Inequalities (Supports Course SLO #1)**
Learning Objectives
The student will be able to…
- Use the properties of equality to solve equations.
- Solve a literal equation for one of the unknowns.
- Translate written English phrases into algebraic expressions.
- Solve application problems involving equalities.
- Solve linear inequalities and express the solution graphically and as an interval.
- Graph linear compound inequalities.
- Solve application problems involving inequalities.

Unit II **Graphs of Linear Equations (Supports Course SLO #2)**
Learning Objectives
The student will be able to…
- Find ordered pairs that are solutions to linear equations and determine if they are correct.
- Understand slope as being a rate of change.
- Graph linear equations of the form $y = mx + b$ and $Ax + By = C$ by using a table of values.
- Graph a line that passes through a given point and has a given slope.
- Determine whether two given lines are parallel or perpendicular.
- Determine the x and y intercept of linear equations.
- Solve application problems involving linear equations.

Unit III **Exponents and Polynomials (Supports Course SLO #3)**
Learning Objectives
The student will be able to…
- Classify and evaluate polynomials.
- Apply the mathematical operations of addition and subtraction to polynomials.
- Apply the rules of exponents to simplify expressions, multiply polynomials and divide polynomials.
- Apply rules for integer exponents to scientific notation.
- Solve application problems involving polynomials and scientific notation.

Unit IV **Factoring and Quadratic Equations (Supports Course SLO #4, 5)**
Learning Objectives
The student will be able to…
- Identify the greatest common factor and use it to factor a polynomial.
- Factor by grouping.
- Factor quadratic expressions, $ax^2 + bx + c$ when $a = 1$ and when $a \neq 1$.
- Factor trinomials of higher order by removing a GCF first then factoring the remaining quadratic factor.
- Factoring special products such as difference of two squares and perfect square trinomials.
- Solve quadratic equations by factoring.

Unit V **Rational Expressions and Radicals (Supports Course SLO #6)**
Learning Objectives
The student will be able to…
- Simplify rational expressions.

- Perform arithmetic operations with rational expressions.
- Solve rational equations.
- Simplify radicals with algebraic expressions.
- Perform arithmetic operations with radicals.
- Solve application problems involving rational expressions

Evaluation of student learning:

Students should receive regular feedback on their work through tests, quizzes, and homework. All learning outcomes are assessed through tests. Questions will be selected to evenly assess all expected outcomes.

Grades will be assigned as detailed below
Unit Tests (2)	30%
Quizzes and Homework	10%
Midterm Exam	25%
Final Exam	35%