

MAT011 Transitional Algebra (3 credit hours)

Official Course Description:	Provides individualized, accelerated, mastery-level progression through entry-level college mathematics prerequisite competencies as defined by KY Council of Postsecondary Education. Note: A passing grade in this course does not necessarily indicate that all prerequisites for all entry-level college mathematics courses have been met.
Prerequisites:	KCTCS Placement Exam
Delivery Mode:	In-Person Only, Computer Lab Setting
Credit Hour Note:	This course may be repeated up to three (3) times for additional developmental credit for a total of nine (9) credit hours.
Type of Course:	Competency-based, mastery-learning, emporium course that provides individualized instruction at a flexible-pace. Course allows for acceleration through developmental math requirements. May require multiple enrollments to complete all developmental math requirements based on student's progress and program needs.
Advising Note:	For any student who was previously enrolled in MAT011, please look for KYOTE Math Placement scores and/or Special Credit by Exam received to verify college-level math prerequisites.

Official Course Competencies:

Upon completion of this course, the student can demonstrate proficiency of at least 12 consecutive competencies from the list below:

1. State and use properties of real numbers.
2. Perform arithmetic operations on integers, fractions and decimals.
3. Round whole numbers and decimals to an indicated place value.
4. Evaluate whole number powers of integers, fractions and decimals.
5. Evaluate square roots of perfect squares of integers, fractions and decimals.
6. State and use the order of operations on integers, fractions and decimals.
7. Simplify and evaluate algebraic expressions.
8. Use both the addition and multiplication properties to solve basic linear equations in one variable.
9. Solve problems involving ratios and proportions.
10. Solve problems involving percents.
11. Convert among fractions, decimals and percents.
12. Calculate and solve applied problems using perimeter, circumference, area, volume, and surface area.
13. Solve linear equations and applications in one variable.
14. Solve and graph linear inequalities in one variable.
15. Graph linear equations in two-variables using multiple methods.
16. Determine the slope of a line given two points, its graph, or its equation.
17. Determine an equation of a line given two points or a point and slope.
18. Graph linear inequalities in two-variables.
19. Solve systems of linear equations in two-variables using multiple methods.
20. Use the properties of integer and basic rational ($1/n$) exponents to simplify algebraic expressions.
21. Add, subtract, and multiply polynomials with one or more variables.
22. Factor polynomials by finding the greatest common factor and factor simple trinomials.
23. Solve quadratic equations and applications by factoring.
24. Graph parabolas.
25. Solve and graph compound inequalities and solve absolute value equations and inequalities.
26. Write equations of lines, including parallel and perpendicular lines, from given data, verbal descriptions and graphs.
27. Determine whether a given correspondence or graph represents a function.
28. Evaluate and determine the domain of polynomial, rational and radical functions.
29. Completely factor polynomial functions including finding the greatest common factor, using grouping, recognizing special products, and factoring general trinomials.
30. Use properties of rational exponents to rewrite and simplify numeric and algebraic expressions.
31. Add, subtract, multiply, and divide polynomial, rational, and radical expressions.
32. Solve polynomial, rational and radical equations.
33. Introduce complex numbers and simplify radicals of both positive and negative real numbers.
34. Solve quadratic equations with complex solutions using factoring, completing the square, and the quadratic formula.
35. Graph parabolas by finding the vertex and axis of symmetry and plotting points.
36. Model and solve applications based on linear, quadratic, and exponential function

MAT011 Course Outline:**I. Block I: Prealgebra (Competencies 1 – 12)**

- A. Whole Numbers
- B. Integers
- C. Fractions
- D. Decimals
- E. Order of Operations on Real Numbers
- F. Algebraic Expressions
- G. Basic Linear Equations
- H. Ratios & Proportions
- I. Basic Percents
- J. Geometry

II. Block II-A: Preparation for Liberal Arts Mathematics (Competencies 13 – 24)

- A. General Linear Equations in one-variable
- B. Linear Inequalities in one-variable
- C. Linear Equations in two-variables
- D. Linear Inequalities in two-variables
- E. Systems of Linear Equations
- F. Rules of Exponents
- G. Square Roots and Basic Rational Exponents ($1/n$)
- H. Polynomials
- I. Basic Factoring
- J. Quadratic Equations

III. Block II-T: Preparation for Technical Math

- A. General Linear Equations in one-variable
- B. Linear Inequalities in one-variable
- C. Linear Equations in two-variables
- D. Linear Inequalities in two-variables
- E. Systems of Linear Equations
- F. Rules of Exponents
- G. Square Roots and Basic Rational Exponents ($1/n$)
- H. Polynomials
- I. Measurement
- J. Scientific Notation
- K. Variation

IV. Block III: Preparation for College Algebra (Competencies 25 – 36)

- A. Absolute Value Equations and Inequalities
- B. Linear Equations in two-variables (including parallel & perpendicular)
- C. Functions
- D. General Factoring
- E. Polynomial Functions and Equations
- F. Rational Functions and Equations (including rational exponents)
- G. Radical Functions and Equations
- H. Quadratic Equations with Complex Solutions
- I. Graphing Quadratic Functions
- J. Introduction to Exponential Functions