

MAHD 081/MAT 141 Course Assessment Objectives

Objectives related to general course outcomes:

Students will be able to:

1. present clear and concise explanations of their work.
2. reason mathematically to interpret and solve problems.
3. transfer geometric visualization onto paper and into words.
4. communicate mathematics clearly and accurately, using correct terminology.

Objectives related to problem-solving:

Students will be able to:

1. reason mathematically to solve problems using
 - a. transformations
 - b. dimensional analysis
 - c. coordinate geometry
 - d. similar triangles and congruent triangles
2. choose appropriate problem-solving techniques to solve mathematical problems.

Objectives related to specific topics:

Students will be able to:

1. give analytical descriptions of geometric figures in the plane and in space.
2. demonstrate relationships in geometric figures such as symmetry, perpendicularity, parallelism.
3. use the corresponding angles property, alternate interior angles property.
4. determine the measures of central angles, vertex angles and exterior angles of a regular polygon.
5. perform conversions within the English system of measurement for length, area, volume and weight.
6. perform conversions within the metric system of measurement for length, area, volume and weight.
7. perform “rough” conversions between metric and English systems of measurements.
8. justify formulas for area and perimeter of plane figures such as triangles, parallelograms and trapezoids.
9. determine perimeters and areas of standard and non-standard plane figures.
10. determine the surface area of standard and non-standard space figures.
11. determine the volume of standard and non-standard space figures.
12. apply the Pythagorean theorem to find lengths and solve real world problems.
13. apply congruence and similarity properties for triangles to determine the congruence or similarity of triangles and to solve real world problems.
14. perform and justify compass and straightedge constructions.
15. describe the following and find them for any given triangle using a compass and straightedge or coordinate geometry: medians, altitudes, angle bisectors, perpendicular bisectors of the sides, circumcenter, centroid, incenter, orthocenter.
16. describe and perform isometries (translation, reflection, rotation) and size transformations in the plane.
17. describe and analyze tessellations with polygons, including regular and semiregular tessellations.

MAHD092 – Basic Mathematical Skills and Essential Algebra

MAHD092 is a basic mathematical skills course which builds the mathematical foundation for students and then develops their algebraic skills.

Upon successful completion of the course, students should be able to:

1. Perform arithmetic operations on whole numbers, integers, fractions, and decimals, and when necessary, write the answer in simplest form.
2. Identify examples of the commutative, associative, and distributive laws.
3. Read and interpret tables and graphs and plot points on a number line and in a plane.
4. Simplify and evaluate algebraic expressions using order of operations.
5. Solve linear equations and inequalities in one variable.
6. Solve literal equations for the designated variable.
7. Write decimals as percent and vice versa.
8. Write ratios and solve proportions.
9. Graph linear equations in two variables by plotting points and finding intercepts.
10. Graph linear inequalities in two variables.
11. Find the slope of a line given two points, its graph, or its equation.
12. Simplify expressions with integer and rational exponents using the product, quotient, and power rules.
13. Add, subtract, multiply, and divide polynomials with one or more variables.
14. Factor the greatest common factor from a quadratic; factor simple trinomials of the form $ax^2 + bx + c$.
15. Simplify square roots of numeric and algebraic expressions.
16. Solve quadratic equations.
17. Determine an equation of a line given two points or a point and slope.
18. Solve systems of linear equations in two variables by graphing, substitution, and elimination.
19. Graph parabolas by finding the vertex and axis of symmetry and plotting points.
20. Apply the concepts learned in the course to solve application problems, including:
 - perimeter, area, and volume of geometric figures
 - motion problems (distance = rate · time)
 - percentage problems
 - maximization and minimization problems

MAHD 094: Essential Algebra Part III

MAHD 094 is an alternative, more flexible course for students needing only portions of the MAHD 095 course. Using an emporium model, students will be provided the opportunity to learn personally targeted concepts needed to resolve their developmental mathematics deficiencies and develop a basic foundation of algebraic skills. This course is a prerequisite to various general education mathematics courses.

Upon successful completion of the course, students should be able to:

1. Simplify and evaluate algebraic expressions using order of operations.
2. Solve linear equations and inequalities in one variable.
3. Solve literal equations for the designated variable.
4. Solve proportions.
5. Graph linear equations in two variables by plotting points and finding intercepts.
6. Graph linear inequalities in two variables.
7. Find the slope of a line given two points, its graph, or its equation.
8. Simplify expressions with integer and rational exponents using the product, quotient, and power rules.
9. Add, subtract, multiply, and divide polynomials with one or more variables.
10. Factor the greatest common factor from a polynomial; factor simple trinomials of the form $ax^2 + bx + c$.
11. Simplify square roots of numeric and algebraic expressions.
12. Solve quadratic equations using the quadratic formula.
13. Determine an equation of a line given two points or a point and slope.
14. Solve systems of linear equations in two variables by graphing, substitution, and elimination.
15. Graph parabolas by finding the vertex and axis of symmetry and plotting points.
16. Apply the concepts learned in the course to solve application problems.

MAHD 095: Essential Algebra

MAHD 095 is an introductory algebra course providing students with the opportunity to develop a basic foundation of algebraic skills. This course is a prerequisite to various general education mathematics courses.

Upon successful completion of the course, students should be able to:

1. Simplify and evaluate algebraic expressions using order of operations.
2. Solve linear equations and inequalities in one variable.
3. Solve literal equations for the designated variable.
4. Solve proportions.
5. Graph linear equations in two variables by plotting points and finding intercepts.
6. Graph linear inequalities in two variables.
7. Find the slope of a line given two points, its graph, or its equation.
8. Simplify expressions with integer and rational exponents using the product, quotient, and power rules.
9. Add, subtract, multiply, and divide polynomials with one or more variables.
10. Factor the greatest common factor from a polynomial; factor simple trinomials of the form $ax^2 + bx + c$.
11. Simplify square roots of numeric and algebraic expressions.
12. Solve quadratic equations using the quadratic formula.
13. Determine an equation of a line given two points or a point and slope.
14. Solve systems of linear equations in two variables by graphing, substitution, and elimination.
15. Graph parabolas by finding the vertex and axis of symmetry and plotting points.
16. Apply the concepts learned in the course to solve application problems.

MAHD 099: Intermediate Algebra

MAHD 099 is an intermediate algebra course providing students with the opportunity to develop the competencies to be successful in college algebra and various other STEM courses. This course is a prerequisite to MAT 109: Algebra for College Students and select science classes.

Upon successful completion of the course, students should be able to:

1. Factor polynomials by grouping, ac-method, and recognition of patterns such as difference of squares and perfect trinomial squares.
2. Add, subtract, multiply, and divide rational expressions containing monomials, binomials, and trinomials in the numerators and denominators.
3. Solve rational equations containing monomials, binomials, and trinomials in the numerators and denominators.
4. Determine whether a given correspondence or graph represents a function.
5. Evaluate functions and find the domains of polynomial, rational, and square root functions.
6. Determine an equation of a line given two points, a point and slope, or a point and a parallel or perpendicular line.
7. Solve absolute value equations and inequalities.
8. Solve equations with radicals.
9. Simplify square roots and cube roots of monomials in one or several variables. Introduce complex numbers.
10. Evaluate real numbers raised to rational exponents and simplify expressions containing rational exponents.
11. Convert expressions with rational exponents to radical form and vice versa.
12. Solve quadratic equations using factoring, completing the square, and the quadratic formula.
13. Graph parabolas by finding the vertex and axis of symmetry and plotting points.
14. Apply the concepts learned in the course to solve application problems involving area of rectangles and triangles, Pythagorean Theorem, motion, and work.