## Math 253 - Instructional Objectives and Student Learning Outcomes

**The goal for this course is to provide students with the necessary skills to be successful in the transfer level mathematics courses in which they may enroll or to satisfy their degree requirement.**

| **Instructional Objective**<br>Students enrolled in this class will: | **Corresponding Learning Outcomes**<br>Students that successfully complete this course will be able to: |
|---|---|
| 1. Review factoring and rational expressions | a. Factor trinomials.<br>b. Factor difference of squares, difference of cubes, and sums of cubes.<br>c. Solve application problems using polynomials.<br>d. Simplify simple and complex rational expressions.<br>e. Add, subtract, multiply and divide rational expressions.<br>f. Solve polynomials and rational equations.<br>g. Solve application problems using rational expressions and equations. |
| 2. Learn to solve systems of linear equations in two and three variables. | a. Solve systems of linear equations with two variables using graphing, substitution and elimination methods.<br>b. Solve systems of linear equations in three variables using substitution and elimination methods.<br>c. Translate verbal expressions into systems of equations and solve them. |
| 3. Learn to solve linear inequalities and linear equations involving absolute value. | a. Use interval and set builder notation when solving inequalities.<br>b. Use set union and intersection when solving inequalities.<br>c. Solve linear inequalities using the multiplication and addition principles.<br>d. Solve linear equations and inequalities involving absolute values.<br>e. Solve inequalities in two variables. |

| | |
|---|---|
| 4. Learn radicals, rational exponents and complex numbers. | a. Write an expression involving radicals using rational exponents and vice versa.<br>b. Apply exponent rules to rational exponents.<br>c. Perform operations with radicals and/or rational exponents.<br>d. Solve equations and applications involving radicals and/or rational exponents.<br>e. Perform operations with complex numbers. |
| 5. Learn to solve quadratic equations and inequalities. | a. Solve quadratic equations by factoring.<br>b. Solve quadratic equations by completing the square.<br>c. Solve quadratic equations using the quadratic formula.<br>d. Graph quadratic functions identifying intercepts, vertex and axis of symmetry.<br>e. Solve equations quadratic in form.<br>f. Solve applications involving quadratic equations and equations quadratic in form. |
| 6. Learn to work with functions. | a. State the definition of a relation and a function.<br>b. Use function notation correctly.<br>c. Find the domain and range of a function.<br>d. Combine functions by addition, subtraction, multiplication, division and composition.<br>e. Graph functions by plotting points.<br>f. Graph polynomial and rational functions by using fundamental characteristics of these functions.<br>g. Graph functions using transformations such as vertical and horizontal translations, stretching, shrinking and reflections.<br>h. Find the inverse function of a given function.<br>i. Graph the inverse function based on the graph of the original function. |
| 7. Learn to perform algebraic operations with exponential and logarithmic functions. | a. Define and graph exponential and logarithmic functions.<br>b. Apply properties related to exponential and logarithmic functions. |

| | |
|---|---|
| | c. Solve exponential and logarithmic equations.<br>d. Solve application problems involving exponential and logarithmic functions. |
| 8. Learn the basic principles of analytic geometry. | a. Find the distance between two points.<br>b. Find the midpoint of a segment.<br>c. Use the method of completing the square to put the equation of a parabola or a circle in standard form.<br>d. Identify and sketch the graph of a parabola or a circle from its equation in standard form. |