Math 125 Course Content and Objectives

COURSE CONTENT AND SCOPE - **Lecture:** Outline the topics included in the lecture portion of the course *(Outline reflects course description, all topics covered in class).*	Hours Per Topic	COURSE OBJECTIVES - **Lecture:** Upon successful completion of this course, the student will be able to...*(Use action verbs - see Bloom's Taxonomy for 'action verbs requiring cognitive outcomes.')*
Review of expressions.	7	Evaluate an expression. Apply the distributive property. Combine like terms. Verify solutions to equations.
Review of solving linear equations.		Solve linear equations using the addition principle. Solve linear equations using the multiplication principle. Solve equations using both the addition and multiplication principles. Plot points in the coordinate plane. Find solutions for equations in two unknowns.
Review of graphing linear equations.		Graph linear equations by plotting solutions. Graph linear equations using intercepts. Graph vertical and horizontal lines.
Review of polynomials.		Add and subtract polynomials. Multiply polynomials. Divide polynomials. Write a polynomial as a product of a monomial greatest common factor (GCF) and a polynomial.
Review of factoring.		Factor by grouping. Factor trinomials of the form x^2 + bx + c. Factor trinomials of the form ax^2 + bx + c, where a is not equal to 1. Factor special products.
Functions and graphs.	9	Identify the domain and range of a relation and determine if the relation is a function. Identify functions and their domain and range. Find the value of a function. Graph linear functions.
Introduction to functions, function notation, and function operations.		Add or subtract functions, multiply functions, and divide functions.
Systems of linear equations and problem solving.	11	Determine if an ordered pair is a solution for a system of equations. Solve a system of linear equations graphically. Classify systems of linear equations in two unknowns.
Review of solving systems of linear equations in two variables graphically.		Solve systems of linear equations using substitution. Solve applications involving two unknowns using a system of equations.
Review of solving systems of linear equations in two variables by substitution.		Solve systems of linear equations using elimination. Solve applications using elimination.

Review of solving systems of linear equations in two variables by elimination.		Determine if an ordered triple is a solution for a system of equations. Understand the graphs of systems of three equations. Solve a system of three linear equations using the elimination method. Solve applications involving three unknowns using a system of equations.
Solving systems of linear equations in three variables.		Write a system of equations as an augmented matrix. Solve a system of linear equations by transforming its augmented matrix to echelon form.
Solving systems of linear equations using matrices or Cramer's Rule.		Evaluate determinants of 2 x 2 matrices. Evaluate determinants of 3 x 3 matrices. Solve systems of equations using Cramer's Rule.
Inequalities and problem solving: Inequalities, equations, and absolute value.	9	Solve compound inequalities involving 'and.' Solve compound inequalities involving 'or.' Solve equations involving absolute value. Solve absolute value inequalities involving less than. Solve absolute value inequalities involving greater than.
Solving systems of linear inequalities.		Graph the solution set of a system of linear inequalities. Solve applications involving a system of linear inequalities.
Exponents, radicals, radical expressions and functions.	12	Find the nth root of a number. Approximate roots using a calculator. Simplify radical expressions. Evaluate radical functions. Find the domain of radical functions. Solve applications involving radical functions.
Rational exponents.		Evaluate rational exponents. Write radicals as expressions raised to rational exponents. Simplify expressions with rational number exponents using the rules of exponents. Use rational exponents to simplify radical expressions.
Multiplying, dividing, and simplifying radicals.		Multiply and divide radical expressions. Use the product rule to simplify radical expressions.
Adding, subtracting, and multiplying radical expressions.		Add or subtract like radicals. Use the distributive property in expressions containing radicals. Simplify radical expressions that contain mixed operations.
Rationalizing numerators and denominators of radical expressions.		Rationalize denominators. Rationalize denominators that have a sum or

		difference with a square root term. Rationalize numerators.
Radical equations and problem solving.		Use the power rule to solve radical equations.
Complex numbers.		Write imaginary numbers using i. Perform arithmetic operations with complex numbers. Raise i to powers.
Quadratic functions and equations. Completing the square.	13	Use the square root principle to solve quadratic equations. Solve quadratic equations by completing the square.
Solving quadratic equations using the quadratic formula.		Solve quadratic equations using the quadratic formula. Use the discriminant to determine the number of real solutions that a quadratic equation will have. Find the x- and y- intercepts of a quadratic function. Solve applications using the quadratic formula.
Solving equations that are quadratic in form.		Solve equations by rewriting them in quadratic form. Solve equations that are quadratic in form by using substitution. Solve applications problems using equations that are quadratic in form.
Graphing quadratic equations.		Graph quadratic functions of the form f(x) = ax^2. Graph quadratic functions of the form f(x) = ax^2 + k. Graph quadratic functions of the form f(x) = a(x-h)^2. Graph quadratic functions of the form f(x) = a(x-h)^2 + k. Graph quadratic functions of the form f(x) = ax^2 + bx + c. Solve applications involving parabolas.
Solving nonlinear inequalities.		Solve quadratic and other inequalities. Solve rational inequalities.
Exponential and logarithmic functions. Composite and inverse functions.	11	Find the composition of two functions. Show that two functions are inverses. Show that a function is one-to-one. Find the inverse of a function. Graph a given function's inverse function.
Exponential functions.		Define and graph exponential functions. Solve equations of the form b^x = b^a for x. Use exponential functions to solve application problems.
Logarithmic functions.		Convert between exponential and logarithmic forms. Solve logarithmic equations by changing to exponential form. Graph logarithmic functions. Solve applications involving

Properties of logarithms. Common and natural logarithms. Exponential and logarithmic equations with applications.		logarithms. Apply the inverse property of logarithms. Apply the product, quotient, and power properties of logarithms. Define common logarithms and evaluate them using a calculator. Solve applications using common logarithms. Define natural logarithms and evaluate them using a calculator. Solve applications using natural logarithms. Solve equations that have variables as exponents. Solve equations containing logarithms. Solve applications involving exponential and logarithmic functions. Use the change-of-base formula.
Conic sections: The parabola and the circle. Ellipses and hyperbolas. Nonlinear systems of equations.	8	Graph parabolas of the form x = a(y-k)^2 + h. Find the distance between two points. Graph circles of the form (x-h)^2 + (y-k)^2 = r^2. Find the equation of a circle with a given center and radius. Graph circles of the form x^2 + y^2 + dx + ey + f = 0. Graph ellipses and hyperbolas. Solve nonlinear systems of equations using substitution. Solve nonlinear systems of equations using elimination. Graph nonlinear inequalities. Graph the solution set of a system of nonlinear inequalities.
Arithmetic sequences and series. Geometric sequences and series. Binomial theorem.	8	Find the terms of a sequence when given the general term. Define and write arithmetic sequences, find their common difference, and find a particular term. Define and write series, find partial sums, and use summation notation. Write arithmetic series and find their sums. Write a geometric sequence and find its common ratio and a specified term. Find partial sums of geometric series. Find the sums of infinite geometric series. Solve applications using geometric series. Expand a binomial using Pascal's triangle. Evaluate factorial notation and binomial coefficients. Expand a binomial using the binomial

		theorem. Find a particular term of a binomial expansion.
Final examination.	2	Final examination.
Total: Total Lecture Hours In Section I Class Hours:	90 90	