

# Math 134: Accelerated Elementary and Intermediate Algebra

## Course Content and Objectives

| <b>COURSE CONTENT AND SCOPE</b><br>- <b>Lecture:</b> Outline the topics included in the lecture portion of the course (Outline reflects course description, all topics covered in class). | <b>Hours Per Topic</b> | <b>COURSE OBJECTIVES</b><br>- <b>Lecture:</b> Upon successful completion of this course, the student will be able to... (Use action verbs - see <a href="#">Bloom's Taxonomy</a> for 'action verbs requiring cognitive outcomes.')   |
|---|------------------------|--|
| <a href="#">Linear equations and inequalities.</a>  | 4                      | <a href="#">Review of real numbers; Simplify algebraic expressions; Solve linear equations and inequalities in one variable; Solve distance problems, mixture problems, and other application problems involving linear equations in one variable.</a>   |
| <a href="#">Polynomials and exponents.</a>  | 3                      | <a href="#">Perform basic arithmetic operations on polynomials; Simplify expressions containing positive and negative exponents; Express answers in Scientific Notation; Use Synthetic Division to divide polynomials by binomials.</a>  |
| <a href="#">Factoring polynomials and solving quadratic equations by factoring.</a>   | 5                      | <a href="#">Factor polynomials using appropriate methods; Solve quadratic equations by factoring; Solve application problems involving quadratic equations.</a>  |
| <a href="#">Inequalities and absolute value.</a>  | 6                      | <a href="#">Solve compound inequalities in one variable; Solve absolute value equations and inequalities in one variable; Solve polynomial inequalities; Solve rational inequalities.</a>  |
| <a href="#">Functions and graphs.</a>   | 3                      | <a href="#">Evaluate functions; Graph some basic nonlinear functions; Graph piecewise-defined functions; Graph functions via transformation such as shift and reflection.</a>  |
| <a href="#">Systems of linear equations and inequalities.</a>   | 4                      | <a href="#">Solve systems of linear equations in two variables by graphing, substitution, and addition methods; Solve systems of linear equations in three variables; Solve application problems involving systems of linear equations.</a>  |
| <a href="#">Graphs and equations of lines.</a>  | 6                      | <a href="#">Plot points on the rectangular coordinate system; Graph linear equations in two variables using various methods; Find the intercepts and slopes of linear equations; Find equations of lines; Find equations of parallel lines and perpendicular lines; Identify relations, domains, and ranges; Define functions. Use function notations for lines.</a> |

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| Rational expressions.                              | 8 | Identify domain of and simplify rational expressions; Perform basic arithmetic operations on rational expressions; Solve equations containing rational expressions; Solve proportion problems, distance problems, work done problems, and other application problems with rational equations; Simplify complex fractions.  |
| Rational exponents, radicals, and complex numbers. | 8 | Simplify radical expressions; Evaluate radical functions; Use rational exponents to simplify radical expressions; Add, subtract, and multiply radical expressions; rationalize denominators and numerators of radical expressions; Solve radical equations; Solve application problems involving radical equations; Simplify complex numbers; Perform basic arithmetic operations with complex numbers.          |
| Quadratic functions and their graph.               | 4 | Graph quadratic functions defined by $f(x) = a(x-h)^2 + K$ ; Graph quadratic functions by finding the vertex using $x = -b/(2a)$ , intercepts, and symmetric points; Find maximum or minimum values of quadratic functions.  |
| Quadratic equations.                               | 4 | Use the square root property to solve quadratic equations; Solve quadratic equations by completing the square; Solve quadratic equations by the quadratic formula; Use the u substitution to solve equations in quadratic form; Solve application problems that lead to quadratic equations.   |
| Composite functions and inverse functions.         | 4 | Find the sum, difference, product, and quotient of functions; Find composite functions; Find inverse functions of one-to-one functions; Graph functions and their inverse functions; Use composite functions to determine whether functions are inverses of each other.  |
| Sequences and series.                              | 3 | Find the general terms of sequences; Find the common differences of arithmetic sequences; Find the common ratios of geometric sequences; Find the general terms of arithmetic or geometric sequences; Solve application problems involving sequences; Evaluate finite series; Write series with summation notations; Find partial sums of arithmetic and geometric sequences; Find sums of the terms of infinite |

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| Conic sections.                               | 2  | Graph parabola, circle, ellipse, and hyperbola. Write equations of circles; Graph nonlinear inequalities and systems of nonlinear inequalities.   |
| Exponential and logarithmic functions.        | 6  | Graph exponential functions; Solve exponential equations; Model and solve exponential growth and decay problems; Graph logarithmic functions; Use logarithmic properties to simplify logarithmic expressions; Use a calculator and the change of base formula to approximate logarithms of any positive bases; Solve logarithmic equations; Solve application problems involving exponential and logarithmic equations. |
| Final examination.                            | 2  | Final examination.  |
| Total:  | 72 |   |
| Total Lecture Hours In Section I Class Hours: | 72 |   |

\*Total lecture and laboratory hours (which include the final examination) must equal totals on page 1.

\*\*In general "activity" courses or portions of courses are classified "laboratory."

| COURSE CONTENT AND SCOPE - Outline<br>the topics included in the lecture portion of the course (Outline reflects course description, all topics covered in class).   | Hours Per Topic | COURSE OBJECTIVES - Upon<br>successful completion of this course, the student will be able to...(Use action verbs - see <a href="#">Bloom's Taxonomy</a> for 'action verbs requiring cognitive outcomes.')  |
|--|-----------------|---|
| Designing individualized study plan based on areas of deficiency; Utilizing computers to graph functions or equations; Setting up modeling functions with real data; and solving activities and problems relating to course content. | 72              | Use computers to appraise knowledge of topics. Design and create study plan per individual based on areas of deficiency. Graph various functions of the same family type and compare similarities and differences. Setup Modeling functions with real data and use computers to graph scatter plots with real data and find equations that describe patterns of scatter plots. Solve problems that required the use of multiple concepts relating to different topics in Algebra. |
| Total:   | 72              |   |
| Total Lab Hours In Section I Class Hours:  | 72              |   |