ALEKS® Course Syllabus

Course Name:	Math 101 Credit Exam – LA Tech University	Course Code:	
ALEKS Course:	College Algebra	Instructor:	
Course Dates:		Course Content:	148 topics

Algebra and Geometry Review (74 topics, no due date)

Properties and Signed Numbers (10 topics)

- Operations with absolute value
- Exponents and integers: Problem type 1
- Exponents and integers: Problem type 2
- Exponents and order of operations
- Evaluating a linear expression in two variables
- Evaluating a quadratic expression in one variable
- Signed fraction addition: Basic
- Signed fraction multiplication: Advanced
- Complex fractions without variables: Problem type 2
- Plotting a point in the coordinate plane

Linear Equations and Applications (8 topics)

- Solving equations with zero, one, or infinitely many solutions
- Simple absolute value equation
- Solving an equation involving absolute value: Basic
- Solving an equation involving absolute value: Advanced
- Algebraic symbol manipulation: Problem type 1
- Algebraic symbol manipulation: Problem type 2
- Finding the perimeter or area of a rectangle given one of these values
- Solving a value mixture problem using a linear equation

Linear Inequalities and Applications (3 topics)

- Solving a compound linear inequality: Problem type 1
- Solving an inequality involving absolute value: Basic
- Solving an inequality involving absolute value

Polynomial Expressions and Factoring (12 topics)

- Combining like terms: Advanced
- Simplifying a sum or difference of two univariate polynomials
- Multiplying a monomial and a polynomial: Univariate with positive leading coefficients
- Multiplying binomials with leading coefficients of 1
- Squaring a binomial: Univariate
- Multiplying conjugate binomials: Univariate
- Multiplying binomials in two variables
- Greatest common factor of two multivariate monomials
- Factoring a quadratic polynomial in two variables with leading coefficient greater than 1
- Factoring out a monomial from a polynomial: Univariate
- Factoring out a monomial from a polynomial: Multivariate
- Factoring a polynomial by grouping: Problem type 2

Rational Expressions and Variation (13 topics)

- Adding rational expressions with common denominators

- Simplifying a ratio of polynomials: Problem type 1
- Multiplying rational expressions: Problem type 1
- Multiplying rational expressions: Problem type 2
- Dividing rational expressions: Problem type 1
- Dividing rational expressions: Problem type 2
- Complex fraction: Problem type 1
- Complex fraction: Problem type 3
- Solving a rational equation that simplifies to a linear equation: Problem type 1
- Solving a rational equation that simplifies to a linear equation: Problem type 2
- Solving a rational equation that simplifies to a linear equation: Problem type 3
- Solving a rational equation that simplifies to a linear equation: Problem type 4
- Word problem on direct variation

Integer Exponents (6 topics)

- Evaluating expressions with exponents of zero
- Evaluating numbers with negative exponents
- Quotient rule with negative exponents: Problem type 1
- Introduction to the power rule of exponents
- Power rule with negative exponents: Problem type 2
- Using the power and product rules to simplify expressions with positive exponents

Radicals and Rational Exponents (20 topics)

- Cube root of an integer
- Square root simplification
- Square root of a perfect square monomial
- Simplifying a radical expression: Problem type 1
- Simplifying a radical expression: Problem type 2
- Square root addition
- Simplifying a sum of radical expressions
- Square root multiplication
- Simplifying a product of radical expressions
- Simplifying a product of radical expressions using the distributive property
- Rationalizing the denominator of a radical expression
- Rationalizing the denominator of a radical expression using conjugates
- Simplifying a higher radical: Problem type 1
- Solving a radical equation that simplifies to a linear equation: One radical
- Solving a radical equation that simplifies to a linear equation: Two radicals
- Solving a radical equation that simplifies to a quadratic equation: One radical
- Rational exponents: Basic
- Rational exponents: Negative exponents and fractional bases
- Rational exponents: Powers of powers
- Converting between radical form and exponent form

Geometry (2 topics)

- Pythagorean Theorem
- Circumference and area of a circle

Functions and Graphs (37 topics, no due date)

Sets, Relations, and Functions (9 topics)

- Union and intersection of finite sets
- Identifying functions from relations
- Evaluating functions: Problem type 1
- Evaluating functions: Problem type 2
- Evaluating a piecewise-defined function
- Variable expressions as inputs of functions
- Domain and range from ordered pairs
- Domain of a square root function
- Domain of a rational function

Linear Functions, Graphs, and Inequalities (13 topics)

- Identifying solutions to linear equations in two variables
- Graphing a line given its equation in slope-intercept form

- Graphing a line given its equation in standard form
- Graphing a line through a given point with a given slope
- Graphing a vertical or horizontal line
- Finding x- and y-intercepts of a line given the equation: Advanced
- Finding slope given the graph of a line on a grid
- Finding slope given two points on the line
- Finding the slope of a line given its equation
- Writing an equation of a line given the y-intercept and another point
- Writing the equation of a line given the slope and a point on the line
- Writing the equations of vertical and horizontal lines through a given point
- Slopes of parallel and perpendicular lines: Problem type 1

Graphs and Transformations (9 topics)

- Finding inputs and outputs of a function from its graph
- Finding intercepts and zeros of a function given the graph
- Domain and range from the graph of a continuous function
- Domain and range from the graph of a piecewise function
- Translating the graph of a function: One step
- Translating the graph of a function: Two steps
- Graphing a parabola of the form $y = ax^2$
- Graphing a simple cubic function
- Graphing a piecewise-defined function

Combining Functions; Composite Functions; Inverse Functions (6 topics)

- Sum, difference, and product of two functions
- Quotient of two functions
- Composition of two functions: Basic
- Determining whether two functions are inverses of each other
- Inverse functions: Problem type 1
- Inverse functions: Problem type 2

Polynomial and Rational Functions (10 topics, no due date)

Quadratic Equations and Functions (4 topics)

- Solving a quadratic equation using the square root property: Problem type 1
- Applying the quadratic formula: Exact answers
- Discriminant of a quadratic equation
- Solving a word problem using a quadratic equation with rational roots

Graphing Quadratic Functions and Inequalities (1 topic)

- Graphing a parabola of the form $y = (x-a)^2 + c$

Complex Numbers; Complex Zeros of Polynomials (5 topics)

- Using i to rewrite square roots of negative numbers
- Adding and subtracting complex numbers
- Multiplying complex numbers
- Dividing complex numbers
- Solving a quadratic equation with complex roots

Exponential and Logarithmic Functions (14 topics, no due date)

Properties of Logarithms (6 topics)

- Converting between logarithmic and exponential equations
- Converting between natural logarithmic and exponential equations
- Evaluating a logarithmic expression
- Basic properties of logarithms
- Expanding a logarithmic expression: Problem type 1
- Change of base for logarithms: Problem type 1

Logarithmic and Exponential Equations (8 topics)

- Solving a logarithmic equation: Problem type 1
- Solving a logarithmic equation: Problem type 2
- Solving a logarithmic equation: Problem type 3
- Solving a logarithmic equation: Problem type 4
- Solving a logarithmic equation: Problem type 5
- Solving an exponential equation: Problem type 1
- Solving an exponential equation: Problem type 2
- Solving an exponential equation: Problem type 3

Systems of Linear Equations and Matrices (7 topics, no due date)

Systems of Linear Equations (4 topics)

- Classifying systems of linear equations from graphs
- Graphically solving a system of linear equations
- Solving a simple system using substitution
- Solving a system of linear equations using elimination with multiplication and addition

Applications (3 topics)

- Solving a word problem involving a sum and another simple relationship using a system of linear equations
- Solving a value mixture problem using a system of linear equations
- Solving a word problem using a 3 by 3 system of linear equations

Conic Sections (6 topics, no due date)

Circles and Ellipses (6 topics)

- Midpoint of a line segment in the plane
- Distance between two points in the plane
- Graphing a circle given its equation in standard form
- Graphing a circle given its equation in general form
- Writing an equation of a circle given its center and a point on the circle
- Graphing an ellipse given its equation in standard form