













# ALEKS<sup>®</sup> Course Syllabus

<b>Course Name:</b> ULC 148 Online: Master Template	<b>Course Code:</b> LNAKM-XX6X6
<b>ALEKS Course:</b> Intermediate Algebra and PreCalculus	<b>Instructor:</b> Mrs. Demler
<b>Course Dates:</b> Begin: 12/26/2017 End: 01/28/2018	<b>Course Content:</b> 317 topics / 193 accessible topics

Dates	Objective
12/26/2017 - 01/10/2018	1. Exam #1 Material (143 topics)
01/11/2018 - 01/17/2018	2. Exam #2 Material (92 topics)
01/18/2018 - 01/24/2018	3. Exam #3 Material (82 topics)

 Accessible Topic - Topics accessible to visually impaired students using a screen reader.

## Exam #1 Material (143 topics, due on 01/10/2018)
































- Evaluating a linear expression: Integer multiplication with addition or subtraction 
- Evaluating a quadratic expression: Integers 
- Reading a point in the coordinate plane
- Plotting a point in the coordinate plane
- Naming the quadrant or axis of a point given its coordinates
- Naming the quadrant or axis of a point given the signs of its coordinates 
- Identifying functions from relations
- Vertical line test
- Domain and range from ordered pairs 
- Evaluating a piecewise-defined function 
- Finding outputs of a one-step function that models a real-world situation: Function notation 
- Finding outputs of a two-step function with decimals that models a real-world situation: Function notation 
- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation 
- Finding an output of a function from its graph
- Finding inputs and outputs of a function from its graph
- Domain and range from the graph of a discrete relation
- Finding domain and range from a linear graph in context
- Domain and range from the graph of a continuous function
- Domain and range from the graph of a piecewise function
- Finding intercepts of a nonlinear function given its graph
- Finding where a function is increasing, decreasing, or constant given the graph
- Finding where a function is increasing, decreasing, or constant given the graph: Interval notation
- Finding local maxima and minima of a function given the graph
- Finding the absolute maximum and minimum of a function given the graph
- Finding values and intervals where the graph of a function is zero, positive, or negative
- Graphing a parabola of the form  $y = ax^2$
- Graphing a parabola of the form  $y = ax^2 + c$
- Graphing a function of the form  $f(x) = ax^2$
- Graphing a function of the form  $f(x) = ax^2 + c$
- Graphing a cubic function of the form  $y = ax^3$
- Dividing a polynomial by a monomial: Univariate 
- Dividing a polynomial by a monomial: Multivariate 
- Polynomial long division: Problem type 1
- Polynomial long division: Problem type 2
- Polynomial long division: Problem type 3
- Synthetic division
- Factoring out a binomial from a polynomial: GCF factoring, basic 
- Factoring a univariate polynomial by grouping: Problem type 1 

- Factoring a univariate polynomial by grouping: Problem type 2 [↗](#)
- Factoring a quadratic with leading coefficient 1 [↗](#)
- Factoring a quadratic in two variables with leading coefficient 1 [↗](#)
- Factoring out a constant before factoring a quadratic [↗](#)
- Factoring a quadratic with leading coefficient greater than 1: Problem type 1 [↗](#)
- Factoring a quadratic with leading coefficient greater than 1: Problem type 2 [↗](#)
- Factoring a quadratic with leading coefficient greater than 1: Problem type 3 [↗](#)
- Factoring a perfect square trinomial with leading coefficient 1 [↗](#)
- Factoring a perfect square trinomial with leading coefficient greater than 1 [↗](#)
- Factoring a difference of squares in one variable: Basic [↗](#)
- Factoring a difference of squares in one variable: Advanced [↗](#)
- Restriction on a variable in a denominator: Linear [↗](#)
- Restriction on a variable in a denominator: Quadratic [↗](#)
- Domain of a rational function: Excluded values [↗](#)
- Using  $i$  to rewrite square roots of negative numbers [↗](#)
- Simplifying a product and quotient involving square roots of negative numbers [↗](#)
- Adding or subtracting complex numbers [↗](#)
- Multiplying complex numbers [↗](#)
- Dividing complex numbers [↗](#)
- Simplifying a power of  $i$  [↗](#)
- Solving an equation of the form  $x^2 = a$  using the square root property [↗](#)
- Solving a quadratic equation using the square root property: Exact answers, basic [↗](#)
- Solving a quadratic equation using the square root property: Exact answers, advanced [↗](#)
- Completing the square [↗](#)
- Solving a quadratic equation by completing the square: Exact answers [↗](#)
- Applying the quadratic formula: Exact answers [↗](#)
- Applying the quadratic formula: Decimal answers [↗](#)
- Solving a quadratic equation with complex roots [↗](#)
- Discriminant of a quadratic equation [↗](#)
- Solving a word problem using a quadratic equation with irrational roots [↗](#)
- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- Graphing a parabola of the form  $y = (x-h)^2 + k$
- Graphing a parabola of the form  $y = x^2 + bx + c$
- Graphing a parabola of the form  $y = a(x-h)^2 + k$
- Graphing a parabola of the form  $y = ax^2 + bx + c$ : Integer coefficients
- Graphing a parabola of the form  $y = ax^2 + bx + c$ : Rational coefficients
- Finding the zeros of a quadratic function given its equation [↗](#)
- Writing a quadratic function given its zeros [↗](#)
- Finding the  $x$ -intercept(s) and the vertex of a parabola [↗](#)
- Rewriting a quadratic function in standard form
- Rewriting a quadratic function to find its vertex and sketch its graph
- Finding the maximum or minimum of a quadratic function [↗](#)
- Word problem involving the maximum or minimum of a quadratic function [↗](#)
- Word problem involving optimizing area by using a quadratic function [↗](#)
- Domain and range from the graph of a quadratic function
- Range of a quadratic function [↗](#)
- Writing the equation of a quadratic function given its graph
- Solving a quadratic equation by graphing
- Variable expressions as inputs of functions: Problem type 1 [↗](#)
- Variable expressions as inputs of functions: Problem type 2 [↗](#)
- Variable expressions as inputs of functions: Problem type 3 [↗](#)
- Domain of a rational function: Interval notation [↗](#)
- Finding the domain of a fractional function involving radicals [↗](#)
- Finding a difference quotient for a linear or quadratic function [↗](#)
- Even and odd functions: Problem type 1
- Even and odd functions: Problem type 2 [↗](#)
- Finding the average rate of change of a function [↗](#)
- Finding the average rate of change of a function given its graph
- Word problem involving average rate of change [↗](#)
- How the leading coefficient affects the shape of a parabola
- Word problem involving a parabola
- Finding  $x$ - and  $y$ -intercepts of the graph of a nonlinear equation [↗](#)
- Determining if graphs have symmetry with respect to the  $x$ -axis,  $y$ -axis, or origin
- Testing an equation for symmetry about the axes and origin
- Identifying polynomial functions
- Finding zeros of a polynomial function written in factored form [↗](#)
- Finding zeros and their multiplicities given a polynomial function written in factored form [↗](#)
- Finding a polynomial of a given degree with given zeros: Real zeros [↗](#)
- Finding  $x$ - and  $y$ -intercepts given a polynomial function [↗](#)

- Determining the end behavior of the graph of a polynomial function 
- Determining end behavior and intercepts to graph a polynomial function
- Matching graphs with polynomial functions
- Inferring properties of a polynomial function from its graph
- Using the remainder theorem to evaluate a polynomial
- The Factor Theorem 
- Using a given zero to write a polynomial as a product of linear factors: Real zeros
- Finding all possible rational zeros using the rational zeros theorem: Problem type 1 
- Finding all possible rational zeros using the rational zeros theorem: Problem type 2 
- Using the rational zeros theorem to find all zeros of a polynomial: Rational zeros
- Using the rational zeros theorem to find all zeros of a polynomial: Irrational zeros
- Multiplying expressions involving complex conjugates 
- Finding a polynomial of a given degree with given zeros: Complex zeros 
- Using a given zero to write a polynomial as a product of linear factors: Complex zeros
- Using the rational zeros theorem to find all zeros of a polynomial: Complex zeros
- Finding the intercepts, asymptotes, domain, and range from the graph of a rational function
- Finding the asymptotes of a rational function: Constant over linear
- Finding the asymptotes of a rational function: Linear over linear
- Finding horizontal and vertical asymptotes of a rational function: Quadratic numerator or denominator
- Finding the asymptotes of a rational function: Quadratic over linear
- Graphing a rational function: Constant over linear
- Graphing a rational function: Linear over linear
- Transforming the graph of a rational function
- Graphing a rational function: Quadratic over linear
- Graphing rational functions with holes
- Matching graphs with rational functions: Two vertical asymptotes
- Graphing a rational function with more than one vertical asymptote
- Writing the equation of a rational function given its graph
- Estimating a limit numerically
- Finding limits from a graph
- Finding limits for a piecewise-defined function
- Determining points of discontinuity from a graph
- Infinite limits and graphs
- Limits at infinity and graphs
- Limits at infinity and rational functions
- Infinite limits and rational functions

## Exam #2 Material (92 topics, due on 01/17/2018)

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- Understanding the product rule of exponents 
- Introduction to the product rule of exponents 
- Product rule with positive exponents: Univariate 
- Product rule with positive exponents: Multivariate 
- Understanding the power rules of exponents 
- Introduction to the power of a power rule of exponents 
- Introduction to the power of a product rule of exponents 
- Power rules with positive exponents: Multivariate products 
- Power rules with positive exponents: Multivariate quotients 
- Power and product rules with positive exponents 
- Simplifying a ratio of multivariate monomials: Basic 
- Introduction to the quotient rule of exponents 
- Simplifying a ratio of univariate monomials 
- Quotient of expressions involving exponents 
- Simplifying a ratio of multivariate monomials: Advanced 
- Power and quotient rules with positive exponents 
- Evaluating expressions with exponents of zero 
- Evaluating an expression with a negative exponent: Whole number base 
- Evaluating an expression with a negative exponent: Positive fraction base 
- Evaluating an expression with a negative exponent: Negative integer base 
- Power rules with negative exponents 
- Converting between radical form and exponent form 
- Rational exponents: Unit fraction exponents and whole number bases 
- Rational exponents: Unit fraction exponents and bases involving signs 
- Rational exponents: Non-unit fraction exponent with a whole number base 
- Rational exponents: Negative exponents and fractional bases 
- Rational exponents: Product rule 
- Rational exponents: Quotient rule 
- Rational exponents: Products and quotients with negative exponents 
- Rational exponents: Power of a power rule 
- Rational exponents: Powers of powers with negative exponents 

- Table for an exponential function [↗](#)
- Graphing an exponential function and its asymptote:  $f(x)=b^x$
- Graphing an exponential function and its asymptote:  $f(x) = a(b)^x$
- Graphing an exponential function and its asymptote:  $f(x)=b^{-x}$  or  $f(x)=-b^{ax}$
- Translating the graph of an exponential function
- Finding domain and range from the graph of an exponential function
- The graph, domain, and range of an exponential function
- Transforming the graph of a natural exponential function
- Graphing an exponential function and its asymptote:  $f(x) = a(e)^{x-b} + c$
- Using a calculator to evaluate exponential expressions [↗](#)
- Evaluating an exponential function that models a real-world situation [↗](#)
- Using a calculator to evaluate exponential expressions involving base  $e$  [↗](#)
- Evaluating an exponential function with base  $e$  that models a real-world situation [↗](#)
- Introduction to compound interest [↗](#)
- Calculating and comparing simple interest and compound interest [↗](#)
- Finding a final amount in a word problem on exponential growth or decay [↗](#)
- Finding the final amount in a word problem on compound interest [↗](#)
- Finding the initial amount and rate of change given an exponential function [↗](#)
- Writing an equation that models exponential growth or decay [↗](#)
- Writing an exponential function rule given a table of ordered pairs [↗](#)
- Choosing an exponential model and using it to make a prediction
- Using a calculator to evaluate natural and common logarithmic expressions [↗](#)
- Converting between logarithmic and exponential equations [↗](#)
- Converting between natural logarithmic and exponential equations [↗](#)
- Evaluating logarithmic expressions [↗](#)
- Solving an equation of the form  $\log_b a = c$  [↗](#)
- Translating the graph of a logarithmic function
- Graphing a logarithmic function: Basic
- The graph, domain, and range of a logarithmic function
- Domain of a logarithmic function: Advanced
- Graphing a logarithmic function: Advanced
- Basic properties of logarithms [↗](#)
- Using properties of logarithms to evaluate expressions [↗](#)
- Expanding a logarithmic expression: Problem type 1 [↗](#)
- Expanding a logarithmic expression: Problem type 2 [↗](#)
- Expanding a logarithmic expression: Problem type 3 [↗](#)
- Writing an expression as a single logarithm [↗](#)
- Change of base for logarithms: Problem type 1 [↗](#)
- Change of base for logarithms: Problem type 2 [↗](#)
- Solving a multi-step equation involving a single logarithm: Problem type 1 [↗](#)
- Solving a multi-step equation involving a single logarithm: Problem type 2 [↗](#)
- Solving a multi-step equation involving natural logarithms [↗](#)
- Solving an equation involving logarithms on both sides: Problem type 1 [↗](#)
- Solving an equation involving logarithms on both sides: Problem type 2 [↗](#)
- Solving an exponential equation by finding common bases: Linear exponents [↗](#)
- Solving an exponential equation by finding common bases: Linear and quadratic exponents [↗](#)
- Solving an exponential equation by using logarithms: Decimal answers, basic [↗](#)
- Solving an exponential equation by using natural logarithms: Decimal answers [↗](#)
- Solving an exponential equation by using logarithms: Decimal answers, advanced [↗](#)
- Solving an exponential equation by using logarithms: Exact answers in logarithmic form [↗](#)
- Solving an exponential equation by using substitution and quadratic factoring
- Finding the time to reach a limit in a word problem on exponential growth or decay [↗](#)
- Finding the time in a word problem on compound interest [↗](#)
- Finding the time given an exponential function with base  $e$  that models a real-world situation [↗](#)
- Finding the final amount in a word problem on continuous compound interest [↗](#)
- Finding the initial amount in a word problem on continuous compound interest [↗](#)
- Finding the final amount in a word problem on continuous exponential growth or decay [↗](#)
- Finding the rate or time in a word problem on continuous exponential growth or decay [↗](#)
- Finding half-life or doubling time [↗](#)
- Writing and evaluating a function modeling continuous exponential growth or decay given doubling time or half-life [↗](#)
- Writing and evaluating a function modeling continuous exponential growth or decay given two outputs [↗](#)

### Exam #3 Material (82 topics, due on 01/24/2018)

- Introduction to the Pythagorean Theorem [↗](#)
- Pythagorean Theorem [↗](#)
- Word problem involving the Pythagorean Theorem [↗](#)
- Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle [↗](#)
- Converting between degree and radian measure: Problem type 1 [↗](#)

- Converting between degree and radian measure: Problem type 2
- Sketching an angle in standard position
- Coterminal angles [↗](#)
- Arc length and central angle measure [↗](#)
- Finding coordinates on the unit circle for special angles [↗](#)
- Finding a point on the unit circle given one coordinate
- Trigonometric functions and special angles: Problem type 1 [↗](#)
- Finding trigonometric ratios from a point on the unit circle
- Trigonometric functions and special angles: Problem type 2 [↗](#)
- Trigonometric functions and special angles: Problem type 3
- Evaluating expressions involving sine and cosine
- Even and odd properties of trigonometric functions [↗](#)
- Using a calculator to approximate sine, cosine, and tangent values [↗](#)
- Using a calculator to approximate cosecant, secant, and cotangent values [↗](#)
- Evaluating a sinusoidal function that models a real-world situation [↗](#)
- Special right triangles: Exact answers [↗](#)
- Sine, cosine, and tangent ratios: Numbers for side lengths [↗](#)
- Sine, cosine, and tangent ratios: Variables for side lengths [↗](#)
- Using the Pythagorean Theorem to find a trigonometric ratio [↗](#)
- Finding trigonometric ratios given a right triangle [↗](#)
- Understanding trigonometric ratios through similar right triangles
- Relationship between the sines and cosines of complementary angles
- Using similar right triangles to find trigonometric ratios
- Using a trigonometric ratio to find a side length in a right triangle [↗](#)
- Using trigonometry to find a length in a word problem with one right triangle [↗](#)
- Using a trigonometric ratio to find an angle measure in a right triangle [↗](#)
- Using trigonometry to find angles of elevation or depression in a word problem
- Solving a right triangle [↗](#)
- Using trigonometry to find a length in a word problem with two right triangles
- Reference angles: Problem type 1 [↗](#)
- Reference angles: Problem type 2
- Determining the location of a terminal point given the signs of trigonometric values [↗](#)
- Finding values of trigonometric functions given information about an angle: Problem type 1 [↗](#)
- Finding values of trigonometric functions given information about an angle: Problem type 2 [↗](#)
- Finding values of trigonometric functions given information about an angle: Problem type 3 [↗](#)
- Finding values of trigonometric functions given information about an angle: Problem type 4
- Sketching the graph of  $y = a \sin(x)$  or  $y = a \cos(x)$
- Sketching the graph of  $y = \sin(bx)$  or  $y = \cos(bx)$
- Sketching the graph of  $y = \sin(x) + d$  or  $y = \cos(x) + d$
- Sketching the graph of  $y = \sin(x+c)$  or  $y = \cos(x+c)$
- Sketching the graph of  $y = a \sin(x+c)$  or  $y = a \cos(x+c)$
- Sketching the graph of  $y = a \sin(bx)$  or  $y = a \cos(bx)$
- Sketching the graph of  $y = a \sin(bx+c)$  or  $y = a \cos(bx+c)$
- Sketching the graph of  $y = a \sin(bx) + d$  or  $y = a \cos(bx) + d$
- Amplitude and period of sine and cosine functions [↗](#)
- Amplitude, period, and phase shift of sine and cosine functions [↗](#)
- Writing the equation of a sine or cosine function given its graph: Problem type 1
- Writing the equation of a sine or cosine function given its graph: Problem type 2
- Word problem involving a sine or cosine function: Problem type 1
- Word problem involving a sine or cosine function: Problem type 2
- Simplifying trigonometric expressions [↗](#)
- Using cofunction identities [↗](#)
- Verifying a trigonometric identity
- Proving trigonometric identities: Problem type 1
- Proving trigonometric identities: Problem type 2
- Proving trigonometric identities: Problem type 3
- Sum and difference identities: Problem type 1 [↗](#)
- Sum and difference identities: Problem type 2 [↗](#)
- Sum and difference identities: Problem type 3
- Sum and difference identities: Problem type 4 [↗](#)
- Proving trigonometric identities using sum and difference properties: Problem type 1
- Proving trigonometric identities using sum and difference properties: Problem type 2
- Double-angle identities: Problem type 1 [↗](#)
- Double-angle identities: Problem type 2 [↗](#)
- Half-angle identities: Problem type 1 [↗](#)
- Half-angle identities: Problem type 2
- Product-to-sum and sum-to-product identities: Problem type 1 [↗](#)
- Product-to-sum and sum-to-product identities: Problem type 2 [↗](#)
- Finding solutions in an interval for a basic equation involving sine or cosine [↗](#)
- Solving a basic trigonometric equation using a calculator

- Solving a basic trigonometric equation involving sine or cosine 
- Finding solutions in an interval for a trigonometric equation in factored form 
- Finding solutions in an interval for a trigonometric equation with a squared function: Problem type 1 
- Finding solutions in an interval for a trigonometric equation with a squared function: Problem type 2 
- Finding solutions in an interval for a trigonometric equation using Pythagorean identities: Problem type 1 
- Finding solutions in an interval for a trigonometric equation using Pythagorean identities: Problem type 2 
- Solving a trigonometric equation using sum and difference identities