

# ALEKS<sup>®</sup> Course Syllabus

<b>Course Name:</b> Math 00021 - 010 SUM1 SUM16	<b>Course Code:</b> EHDXJ-RWGYQ
<b>ALEKS Course:</b> Beginning Algebra	<b>Instructor:</b> Inst. Kellermann
<b>Course Dates:</b> Begin: 08/15/2014 End: 08/15/2015	<b>Course Content:</b> 160 topics
<b>Textbook:</b> Miller/O'Neill/Hyde: Beginning Algebra, 4th Ed. (McGraw-Hill) - ALEKS 360	

## Course Readiness (12 topics, no due date)

### Course Readiness (9 topics)

- Decimal place value: Tenths and hundredths
- Rounding decimals
- Word problem with addition of 3 or 4 decimals and whole numbers
- Multiplication of a decimal by a whole number
- Decimal multiplication: Problem type 1
- Multiplication of a decimal by a power of ten
- Word problem with decimal addition and multiplication
- Division of a decimal by a whole number
- Division of a decimal by a power of ten

### Course Readiness Supplementary Topics (3 topics)

- Word problem with subtraction of a whole number and a decimal: Regrouping with zeros
- Division of a decimal by a 2-digit decimal
- Word problem with decimal subtraction and division

## Chapter 1 - The Set of Real Numbers (74 topics, no due date)

### Section 1.1 (23 topics)

- Factors
- Prime numbers
- Prime factorization
- Least common multiple of 2 numbers
- Equivalent fractions
- Simplifying a fraction
- Addition or subtraction of fractions with the same denominator
- Addition or subtraction of fractions with different denominators
- Product of a unit fraction and a whole number
- Product of a fraction and a whole number: Problem type 1
- Introduction to fraction multiplication
- Fraction multiplication
- The reciprocal of a number
- Division involving a whole number and a fraction
- Fraction division
- Writing an improper fraction as a mixed number
- Writing a mixed number as an improper fraction
- Addition of mixed numbers with the same denominator and carry
- Subtraction of mixed numbers with the same denominator and borrowing
- Addition of mixed numbers with different denominators and carry
- Subtraction of mixed numbers with different denominators and borrowing
- Mixed number multiplication
- Mixed number division

### Section 1.2 (9 topics)

- Fractional position on a number line
- Plotting integers on a number line

- Plotting rational numbers on a number line
- Using a common denominator to order fractions
- Ordering integers
- Square root of a perfect square
- Absolute value of a number
- Identifying numbers as integers or non-integers
- Identifying numbers as rational or irrational

*Section 1.3* (13 topics\*)

- Writing expressions using exponents
- Introduction to exponents
- Order of operations with whole numbers
- Order of operations with whole numbers and grouping symbols
- Order of operations with whole numbers and exponents: Basic
- Order of operations with fractions: Problem type 1
- Order of operations with fractions: Problem type 2
- Perimeter of a square or a rectangle
- Area of a square or a rectangle
- Square root of a perfect square
- Writing a one-step expression for a real-world situation
- Translating a phrase into a two-step expression
- Square root of a rational perfect square

*Section 1.4* (3 topics)

- Writing a signed number for a real-world situation
- Integer addition: Problem type 1
- Integer addition: Problem type 2

*Section 1.5* (7 topics)

- Integer subtraction: Problem type 1
- Integer subtraction: Problem type 2
- Integer subtraction: Problem type 3
- Word problem with addition or subtraction of integers
- Signed fraction addition or subtraction: Basic
- Signed decimal addition and subtraction with 3 numbers
- Operations with absolute value: Problem type 2

*Section 1.6* (9 topics)

- Integer multiplication and division
- Signed fraction multiplication: Advanced
- Exponents and integers: Problem type 1
- Exponents and integers: Problem type 2
- Exponents and signed fractions
- Order of operations with integers
- Order of operations with integers and exponents
- Evaluating a linear expression: Integer multiplication with addition or subtraction
- Evaluating a quadratic expression: Integers

*Section 1.7* (7 topics)

- Combining like terms: Integer coefficients
- Properties of addition
- Distributive property: Integer coefficients
- Properties of real numbers
- Using distribution and combining like terms to simplify: Univariate
- Using distribution with double negation and combining like terms to simplify: Multivariate
- Combining like terms in a quadratic expression

*Chapter 1 Supplementary Topics* (4 topics)

- Word problem with common multiples
- Fractional part of a circle
- Multi-step word problem involving fractions and multiplication
- Signed fraction addition or subtraction: Advanced

(\*) Some topics in this section are also covered in a previous section of this Objective.  
Topics are only counted once towards the total number of topics for this Objective.

## **Additional Topics Appendix** (19 topics, no due date)

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### *Section A.1* (10 topics)

- Decimal place value: Tenths and hundredths
- Rounding decimals
- Converting a decimal to a proper fraction in simplest form: Advanced
- Converting a fraction to a terminating decimal: Basic
- Converting a fraction to a repeating decimal: Basic
- Converting between percentages and decimals
- Converting a percentage to a fraction in simplest form
- Converting a fraction to a percentage: Denominator of 20, 25, or 50
- Finding a percentage of a whole number without a calculator: Basic
- Writing a ratio as a percentage without a calculator

### *Section A.3* (4 topics)

- Perimeter of a polygon
- Perimeter of a square or a rectangle
- Area of a square or a rectangle
- Area of a triangle

### *Section A.4* (5 topics)

- U.S. Customary unit conversion with whole number values
- Metric distance conversion with whole number values
- Converting between metric and U.S. Customary unit systems
- Converting between temperatures in Fahrenheit and Celsius
- Converting between compound units: Basic

## **Chapter 2 - Linear Equations and Inequalities** (38 topics, no due date)

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### *Section 2.1* (8 topics)

- Additive property of equality with whole numbers
- Additive property of equality with decimals
- Additive property of equality with integers
- Multiplicative property of equality with whole numbers
- Multiplicative property of equality with integers
- Multiplicative property of equality with signed fractions
- Additive property of equality with a negative coefficient
- Translating a sentence into a one-step equation

### *Section 2.2* (7 topics)

- Using two steps to solve an equation with whole numbers
- Solving a two-step equation with integers
- Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
- Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
- Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
- Solving a two-step equation with signed fractions
- Solving equations with zero, one, or infinitely many solutions

### *Section 2.3* (3 topics\*)

- Solving a two-step equation with signed fractions
- Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators

### *Section 2.4* (4 topics\*)

- Writing a one-step expression for a real-world situation
- Translating a phrase into a two-step expression
- Translating a sentence into a one-step equation
- Solving a word problem with two unknowns using a linear equation

### *Section 2.5* (2 topics)

- Finding a percentage of a whole number without a calculator: Basic
- Writing a ratio as a percentage without a calculator

*Section 2.6* (1 topic)

- Area of a triangle

*Section 2.8* (11 topics)

- Translating a sentence by using an inequality symbol
- Graphing a linear inequality on the number line
- Translating a sentence into a compound inequality
- Graphing a compound inequality on the number line
- Set builder and interval notation
- Additive property of inequality with whole numbers
- Multiplicative property of inequality with integers
- Solving a two-step linear inequality: Problem type 1
- Solving a two-step linear inequality: Problem type 2
- Solving a linear inequality with multiple occurrences of the variable: Problem type 3
- Solving a compound linear inequality: Graph solution, basic

*Chapter 2 Supplementary Topics* (4 topics)

- Additive property of equality with fractions and mixed numbers
- Solving a fraction word problem using a linear equation of the form  $Ax = B$
- Solving a decimal word problem using a linear equation with the variable on both sides
- Solving a fraction word problem using a linear equation with the variable on both sides

(\*) Some topics in this section are also covered in a previous section of this Objective.  
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**Chapter 3 - Graphing Linear Equations in Two Variables** (24 topics, no due date)

*Section 3.1* (2 topics)

- Reading a point in the coordinate plane
- Plotting a point in the coordinate plane

*Section 3.2* (9 topics)

- Finding a solution to a linear equation in two variables
- Graphing a linear equation of the form  $y = mx$
- Graphing a line given its equation in slope-intercept form: Integer slope
- Graphing a line given its equation in slope-intercept form: Fractional slope
- Graphing a line given its equation in standard form
- Graphing a vertical or horizontal line
- Finding x- and y-intercepts of a line given the equation: Advanced
- Graphing a line given its x- and y-intercepts
- Graphing a line by first finding its x- and y-intercepts

*Section 3.3* (4 topics)

- Finding slope given the graph of a line on a grid
- Finding slope given two points on the line
- Finding the slope of horizontal and vertical lines
- Graphing a line through a given point with a given slope

*Section 3.4* (5 topics)

- Finding the slope and y-intercept of a line given its equation in the form  $y = mx + b$
- Finding the slope and y-intercept of a line given its equation in the form  $Ax + By = C$
- Graphing a line by first finding its slope and y-intercept
- Writing an equation in slope-intercept form given the slope and a point
- Finding slopes of lines parallel and perpendicular to a line given in the form  $Ax + By = C$

*Section 3.5* (5 topics\*)

- Writing an equation in slope-intercept form given the slope and a point
- Writing an equation of a line given the y-intercept and another point
- Writing the equation of the line through two given points
- Writing the equations of vertical and horizontal lines through a given point
- Writing equations of lines parallel and perpendicular to a given line through a point

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## **Chapter 5 - Polynomials and Properties of Exponents** (3 topics, no due date)

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### *Section 5.1* (3 topics)

- Exponents and integers: Problem type 1
- Exponents and integers: Problem type 2
- Exponents and signed fractions

## **Chapter 6 - Factoring Polynomials** (2 topics, no due date)

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### *Section 6.1* (2 topics)

- Factors
- Greatest common factor of 2 numbers

## **Chapter 7 - Rational Expressions and Equations** (3 topics, no due date)

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### *Section 7.4* (1 topic)

- Addition or subtraction of fractions with the same denominator

### *Section 7.6* (2 topics)

- Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators

## **Chapter 8 - Radicals** (3 topics, no due date)

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### *Section 8.1* (3 topics)

- Square root of a perfect square
- Square root of a rational perfect square
- Cube root of an integer