### Entry Requirements for MATH 1510 Coreq (College Algebra)

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<th>PLACEMENT LEVEL</th>
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### Entry Requirements for MATH 1511 Coreq (Trigonometry)

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### Proposed Entry Requirements for MATH 1510 & 1511 Coreqs for Successive Semesters

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# Course Syllabus

**Course Name:** MATH 1507 - MATH 1510 (Combined) - MWF:9-10:50am-T:9-9:50am  
**Course Code:** KH9TM-T4DNL  
**ALEKS Course:** College Algebra  
**Instructor:** Mr. Williams  
**Course Dates:** Begin: 08/24/2016    End: 12/20/2016  
**Course Content:** 289 topics  
**Textbook:** Miller/Gerken: College Algebra, 2nd Ed. (McGraw-Hill) - ALEKS 360

<table>
<thead>
<tr>
<th>Dates</th>
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<tbody>
<tr>
<td>08/24/2016 - 08/29/2016</td>
<td>1. Module 1 (1.1) (17 topics)</td>
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<td>08/30/2016 - 09/04/2016</td>
<td>2. Module 2 (1.3-1.4) (19 topics)</td>
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<td>09/05/2016 - 09/09/2016</td>
<td>3. Module 3 (1.6) (17 topics)</td>
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<td>09/10/2016 - 09/15/2016</td>
<td>4. Module 4 (1.7) (19 topics)</td>
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<td>09/16/2016 - 09/19/2016</td>
<td>5. Module 5 (3.6) (7 topics)</td>
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<td>09/20/2016 - 09/26/2016</td>
<td>6. Module 6 (2.1,2.4) (19 topics)</td>
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<td>09/27/2016 - 10/03/2016</td>
<td>7. Module 7 (2.4-2.5) (16 topics)</td>
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<td>10/04/2016 - 10/11/2016</td>
<td>8. Module 8 (2.3-2.7) (25 topics)</td>
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<td>10/12/2016 - 10/16/2016</td>
<td>9. Module 9 (2.6-2.7) (19 topics)</td>
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<td>10/17/2016 - 10/21/2016</td>
<td>10. Module 10 (2.6) (10 topics)</td>
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<td>10/22/2016 - 10/27/2016</td>
<td>11. Module 11 (2.8,4.1) (21 topics)</td>
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<td>10/28/2016 - 11/03/2016</td>
<td>12. Module 12 (3.1-3.2) (17 topics)</td>
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<td>14. Module 14 (2.2,3.5) (14 topics)</td>
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<td>12/01/2016 - 12/06/2016</td>
<td>17. Module 17 (5.1, 5.4) (8 topics)</td>
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<td>12/07/2016 - 12/10/2016</td>
<td>18. Module 18 (7.1-7.3) (5 topics)</td>
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**Module 1 (1.1)** (17 topics, due on 08/29/2016)

- 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 linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- Solving a two-step equation with signed fractions
- Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
- Solving for a variable in terms of other variables using addition or subtraction: Basic
- Solving for a variable in terms of other variables using addition or subtraction: Advanced
- Solving for a variable in terms of other variables using multiplication or division: Basic
- Solving for a variable in terms of other variables using multiplication or division: Advanced
• Solving for a variable in terms of other variables using addition or subtraction with division
• Solving for a variable inside parentheses in terms of other variables
• Solving for a variable in terms of other variables in a linear equation with fractions
• Solving a rational equation that simplifies to linear: Denominator \( x \)
• Solving a rational equation that simplifies to linear: Denominator \( x+a \)
• Solving a rational equation that simplifies to linear: Denominators \( a \), \( x \), or \( ax \)
• Solving a rational equation that simplifies to linear: Denominators \( ax \) and \( bx \)

**Module 2 (1.3-1.4)** (19 topics, due on 09/04/2016)

• 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 written in factored form
• Finding the roots of a quadratic equation of the form \( ax^2 + bx = 0 \)
• Finding the roots of a quadratic equation with leading coefficient 1
• Finding the roots of a quadratic equation with leading coefficient greater than 1
• Writing a quadratic equation given the roots and the leading coefficient
• 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
• Solving a quadratic equation with complex roots
• Discriminant of a quadratic equation

**Module 3 (1.6)** (17 topics, due on 09/09/2016)

• Introduction to solving an absolute value equation
• Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
• Solving an absolute value equation: Problem type 1
• Solving an absolute value equation: Problem type 2
• Solving a rational equation that simplifies to linear: Like binomial denominators
• Solving a rational equation that simplifies to linear: Unlike binomial denominators
• Solving a quadratic equation needing simplification
• Roots of a product of polynomials
• Solving an equation using the odd-root property: Problem type 2
• Restriction on a variable in a denominator: Quadratic
• Solving a rational equation that simplifies to linear: Factorable quadratic denominator
• Solving a rational equation that simplifies to quadratic: Denominator \( x \)
• Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
• Introduction to solving a radical equation
• Solving a radical equation that simplifies to a linear equation: One radical, basic
• Solving a radical equation that simplifies to a linear equation: One radical, advanced
• Solving a radical equation that simplifies to a linear equation: Two radicals

**Module 4 (1.7)** (19 topics, due on 09/15/2016)

• Solving equations with zero, one, or infinitely many solutions
• Graphing a linear inequality on the number line
• Writing an inequality given a graph on the number line
• Graphing a compound inequality on the number line
• Writing a compound inequality given a graph on the number line
• Set builder and interval notation
• Identifying solutions to a two-step linear inequality in one variable
• Solving a two-step linear inequality: Problem type 1
• Solving a two-step linear inequality: Problem type 2
• Solving a two-step linear inequality with a fractional coefficient
• Solving a linear inequality with multiple occurrences of the variable: Problem type 1
• Solving a linear inequality with multiple occurrences of the variable: Problem type 2
• Solving inequalities with no solution or all real numbers as solutions
• Solving a compound linear inequality: Graph solution, basic
• Solving a compound linear inequality: Interval notation
• Solving an absolute value inequality: Problem type 1
• Writing an absolute value inequality given a graph on the number line
Module 5 (3.6)  (7 topics, due on 09/19/2016)

- Solving an absolute value inequality: Problem type 2
- Solving an absolute value inequality: Problem type 3
- Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators
- Solving a quadratic inequality written in factored form
- Solving a quadratic inequality
- Solving a polynomial inequality: Problem type 1
- Solving a polynomial inequality: Problem type 2
- Solving a rational inequality: Problem type 1
- Solving a rational inequality: Problem type 2

Module 6 (2.1,2.4)  (19 topics, due on 09/26/2016)

- Reading a point in the coordinate plane
- Plotting a point in the coordinate plane
- Table for a linear equation
- Distance between two points in the plane: Exact answers
- Midpoint of a line segment in the plane
- 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: Basic
- Finding \( x \)- and \( y \)-intercepts of a line given the equation: Advanced
- Finding \( x \)- and \( y \)-intercepts of the graph of a nonlinear equation
- Classifying slopes given graphs of lines
- 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 given its slope and \( y \)-intercept
- Graphing a line through a given point with a given slope

Module 7 (2.4-2.5)  (16 topics, due on 10/03/2016)

- Graphing a vertical or horizontal line
- 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 of a line given its slope and \( y \)-intercept
- Writing an equation in slope-intercept form given the slope and a point
- Finding the slope and a point on a line given its equation in point-slope form
- Writing an equation in point-slope 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
- Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
- Finding slopes of lines parallel and perpendicular to a line given in the form \( Ax + By = C \)
- Identifying parallel and perpendicular lines from equations
- Writing equations of lines parallel and perpendicular to a given line through a point
- Solving a linear equation by graphing

Module 8 (2.3-2.7)  (25 topics, due on 10/11/2016)

- Identifying solutions to a linear equation in two variables
- Finding \( x \)- and \( y \)-intercepts given the graph of a line on a grid
- Finding intercepts of a nonlinear function given its graph
- Graphing a parabola of the form \( y = ax^2 \)
- Graphing a parabola of the form \( y = ax^2 + c \)
- Identifying functions from relations
- Vertical line test
- Table for a linear function
- Evaluating functions: Linear and quadratic or cubic
- Evaluating a rational function: Problem type 1
- Evaluating a rational function: Problem type 2
- Table for a square root function
• Evaluating functions: Absolute value, rational, radical
• Evaluating a piecewise-defined function
• Domain of a rational function: Excluded values
• Domain of a rational function: Interval notation
• Domain of a square root function: Basic
• Domain of a square root function: Advanced
• Finding the domain of a fractional function involving radicals
• Determining whether an equation defines a function: Basic
• 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 continuous function
• Domain and range from the graph of a piecewise function
• Domain and range from the graph of a quadratic function

Module 9 (2.6-2.7)  (19 topics, due on 10/16/2016)

• Graphing an absolute value equation of the form y = A|x|
• Graphing a cubic function of the form y = ax^3
• Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin
• Evaluating a cube root function
• Variable expressions as inputs of functions: Problem type 1
• 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
• Graphing a function of the form f(x) = ax + b: Integer slope
• Graphing a function of the form f(x) = ax + b: Fractional slope
• Graphing an absolute value equation in the plane: Basic
• Graphing a function of the form f(x) = ax^2
• Graphing a function of the form f(x) = ax^2 + c
• Graphing a parabola of the form y = (x-h)^2 + k
• Graphing a square root function: Problem type 1
• Graphing a square root function: Problem type 2
• Graphing a cube root function
• Matching parent graphs with their equations
• Graphing a piecewise-defined function: Problem type 1
• Even and odd functions: Problem type 1

Module 10 (2.6)  (10 topics, due on 10/21/2016)

• Translating the graph of a parabola: One step
• Translating the graph of a parabola: Two steps
• Translating the graph of an absolute value function: One step
• Translating the graph of an absolute value function: Two steps
• Translating the graph of a function: One step
• Translating the graph of a function: Two steps
• Transforming the graph of a function by reflecting over an axis
• Transforming the graph of a function by shrinking or stretching
• Transforming the graph of a function using more than one transformation
• Transforming the graph of a quadratic, cubic, square root, or absolute value function

Module 11 (2.8,4.1)  (21 topics, due on 10/27/2016)

• Solving for a variable in terms of other variables in a rational equation: Problem type 1
• Solving for a variable in terms of other variables in a rational equation: Problem type 2
• Algebraic symbol manipulation with radicals
• Solving an equation with a root index greater than 2: Problem type 1
• Solving an equation with a root index greater than 2: Problem type 2
• Variable expressions as inputs of functions: Problem type 2
• Finding a difference quotient for a linear or quadratic function
• Sum, difference, and product of two functions
• Quotient of two functions: Basic
• Combining functions: Advanced
• Introduction to the composition of two functions
• Composition of two functions: Basic
• Composition of a function with itself
• Expressing a function as a composition of two functions
• Horizontal line test
• Determining whether two functions are inverses of each other
• Inverse functions: Linear, discrete
Inverse functions: Quadratic, square root
Inverse functions: Cubic, cube root
Inverse functions: Rational
Graphing the inverse of a function given its graph

Module 12 (3.1-3.2) (17 topics, due on 11/03/2016)

- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
- Graphing a parabola of the form \( y = (x-h)^2 + k \)
- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- 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
- Finding the zeros of a quadratic function given its equation
- 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
- Writing the equation of a quadratic function given its graph
- Finding zeros of a polynomial function written in factored form
- Finding zeros and their multiplicities given a polynomial function written in factored form
- 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

Module 13 (3.3-3.4) (18 topics, due on 11/09/2016)

- Writing a quadratic function given its zeros
- Finding a polynomial of a given degree with given zeros: Real zeros
- Polynomial long division: Problem type 1
- Polynomial long division: Problem type 2
- Polynomial long division: Problem type 3
- Synthetic division
- 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
- Using the conjugate zeros theorem to find all zeros of a polynomial

Module 14 (2.2,3.5) (14 topics, due on 11/18/2016)

- Identifying the center and radius to graph a circle given its equation in standard form
- Identifying the center and radius to graph a circle given its equation in general form: Basic
- Writing the equation of a circle centered at the origin given its radius or a point on the circle
- Writing an equation of a circle given its center and radius or diameter
- Writing an equation of a circle given its center and a point on the circle
- 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
- Matching graphs with rational functions: Two vertical asymptotes

Module 15 (4.2-4.3) (21 topics, due on 11/22/2016)

- Table for an exponential function
- Graphing an exponential function: \( f(x)=b^x \)
Graphing an exponential function: \( f(x) = a(b)^x \)
Graphing an exponential function: \( f(x)=b^{-x} \) 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: \( f(x) = a(e^{-bx} + c) \)
Using a calculator to evaluate exponential expressions
Using a calculator to evaluate exponential expressions involving base \( e \)
Introduction to 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
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
Translating the graph of a logarithmic function
Graphing a logarithmic function: Basic
The graph, domain, and range of a logarithmic function

Module 16 (4.4-4.6)  (19 topics, due on 11/30/2016)

- Evaluating an exponential function that models a real-world situation
- Evaluating an exponential function with base \( e \) that models a real-world situation
- Solving an equation of the form \( \log_b a = c \)
- Basic properties of logarithms
- Expanding a logarithmic expression: Problem type 1
- Expanding a logarithmic expression: Problem type 2
- Writing an expression as a single logarithm
- 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 exponential equation by finding common bases: Linear exponents
- Solving an exponential equation by using logarithms: Decimal answers, basic
- Solving an exponential equation by using natural logarithms: Decimal answers
- 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 half-life or doubling time

Module 17 (5.1, 5.4)  (8 topics, due on 12/06/2016)

- Identifying solutions to a system of linear equations
- Graphically solving a system of linear equations
- Solving a system of linear equations using substitution
- Solving a system of linear equations using elimination with addition
- Solving a system of linear equations using elimination with multiplication and addition
- Graphically solving a system of linear and quadratic equations
- Solving a system of linear and quadratic equations
- Solving a system of nonlinear equations: Problem type 1

Module 18 (7.1-7.3)  (5 topics, due on 12/10/2016)

- Graphing a parabola of the form \( y^2 = ax \) or \( x^2 = ay \)
- Graphing an ellipse given its equation in standard form
- Graphing an ellipse centered at the origin: \( Ax^2 + By^2 = C \)
- Graphing a hyperbola given its equation in standard form
- Graphing a hyperbola centered at the origin: \( Ax^2 + By^2 = C \)
Grading Policy for MATH 1507 & 1510 Co-requisite Course – Fall 2016

Course Outlines:
MATH 1507 1:  https://drive.google.com/file/d/0Bw9MJ317AlNVaHJRdWhJZnBjU1U/view
MATH 1510 2:  https://drive.google.com/file/d/0Bw9MJ317AlNVWm5GSU5QeTdwZmc/view

Instructor:  Mr. Lance Williams
Course Meets:  Monday, Wednesday, Friday 9am-10:50am, Tuesdays 9am-9:50am in Lincoln 404
Office:  Lincoln Hall, Room 408 (The M.A.C.)
E-mail:  llwilliams03@ysu.edu
Telephone:  Text through the Remind app.
Office Hours:  MWF 3-4pm, TR 10am-11am, or by appointment

Course Title:  College Algebra with Intermediate Algebra
Semester:  Fall 2016
Course Credit:  Combined 7 s.h. (4 s.h. + 3 s.h.)
Term ends:  Saturday, December 17

Legal Holidays:
Labor Day:  Monday, September 5, 2016
Veteran’s Day:  Friday, November 11, 2016
No classes; University Open:  Wednesday November 23, 2016
Thanksgiving Day:  Thursday November 24, 2016
Columbus Day Observed:  Friday November 25, 2016

Last day to drop both courses with a grade of “W”:  Saturday, October 29.
Please note: if you intend to drop this course, you will have to drop both the 1507 and 1510 portions as this is a combined course.


Calculator:  Calculators are not permitted on exams, however there may be instances where you may use an on screen calculator for a limited number of problems in ALEKS or in class. (Estimating logarithms, exponents & zeros found from the quadratic formula). No cell phones, tablets or other electronic devices are permitted for any and all assessments.

Cell Phone Policy:  Cell phones are not to be used during class time and must be turned off. Sending text messages during class time will not be tolerated and is grounds for dismissal from the class.
Grading Policy:

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</tr>
</tbody>
</table>

A: 90-100%  B: 80-89%  C: 70-79%  D: 60-69%

Please note: Any student who scores below 50% on the final exam will NOT receive a passing grade for the MATH 1510 portion of the course. (Limited exceptions may apply.)

Exam Schedule: All dates are tentative and are subject to change
Exam 1: Friday, September 16
Exam 2: Friday, October 28
Exam 3: Monday, December 12* (subject to change)

Attendance: Regular attendance is necessary and expected. Attendance will be taken daily and will be one of several factors considered in “borderline” cases of passing or failing the course. If you know ahead of time that you will have an excused absence, please let me know via email. All students are expected to participate in class. This means coming to class with your topic objectives completed and ready to ask or answer questions.

Classroom Conduct: All students are expected to arrive and be prepared to start class ON TIME. Cell phones and other electronic devices must be turned off during class. Sending text messages during class time will not be tolerated and is grounds for dismissal from the class.

Responsibilities: Primary responsibility for learning the material in this course lies with the student. Each student is responsible for attending class regularly, carefully completing daily readings and ALEKS topic objectives, coming to class on time and prepared, and actively participating in class. Any student having trouble with the material is responsible for seeking help from the instructor, tutors at the M.A.C., or fellow
peers. All assignments are expected to be completed. There is generally a strong correlation between the amount of effort expended on assignments and the level of success on exams. It is expected that reading, studying the text and notes, and writing out problems will require at least a three hour per day commitment (one hour in class and two hours outside of class). Any student who chooses not to fulfill the responsibilities outlined here should not expect to succeed in the course. Mathematics is learned by doing because it is inherently a “doing subject”. Simply studying the problems and examples I cover does not usually enhance the learning of mathematics. Responsible collaboration with your peers is encouraged as it will help you to assess whether you are expressing your mathematical ideas well. It is also important to work independently and turn in your own work.

Plagiarism/Cheating: Academic honesty is expected. Cheating on ALEKS assessments, exams, plagiarism, or any kind of unethical behavior may subject the student to severe academic penalties, including expulsion. See “The Code: A Handbook of Student Rights, Responsibilities, and Conduct” for more information. This includes plagiarism of homework exercises, your ALEKS pie and your knowledge checks.

Getting help: In addition to my scheduled office hours, you may also schedule an appointment with me. The Math Assistance Center (M.A.C.) will also be open for the duration of the summer. We have tutors available who can guide you through WebAssign problems, help prepare you for the Gateway exam(s) and all major exams in the course. From time to time I will also invite one of our peer tutors to help with classroom problems during class time. Below is helpful information about the M.A.C.

<table>
<thead>
<tr>
<th>Location</th>
<th>Lincoln Hall, Room 408</th>
</tr>
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<tbody>
<tr>
<td>Website</td>
<td><a href="http://web.ysu.edu/stem/mac">http://web.ysu.edu/stem/mac</a></td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:mathassist@ysu.edu">mathassist@ysu.edu</a></td>
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<tr>
<td>Telephone</td>
<td>(330)-941-3274</td>
</tr>
<tr>
<td>Fall Hours</td>
<td>Monday-Thursday 9am-6pm</td>
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<tr>
<td></td>
<td>Friday 9am-3pm</td>
</tr>
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</table>

\(^{1,2}\) Any grading policies listed in the course outlines on pg. 1 do not apply to this course, they serve as a guide for the content which will be covered.

The instructor reserves the right to change the syllabus to meet class needs or fulfill department standards and objectives. Any changes made will be announced in class, and an updated syllabus will be provided to you.
## Fall 2016
Comparison of Instructional Formats in MATH 1510, College Algebra

<table>
<thead>
<tr>
<th>CRN</th>
<th>INSTRUCTIONAL FORMAT</th>
<th>Average Course Grade</th>
<th>%D,F,W</th>
<th>%A,B,C</th>
<th>No. of Students</th>
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<tbody>
<tr>
<td>46987</td>
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<td>48028</td>
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<tr>
<td>48756</td>
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<td>1.53</td>
<td>61.3%</td>
<td>38.7%</td>
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</tbody>
</table>

### Average Course Grade

- **Traditional Lecture**: 1.95 (47.1% D,F,W, 52.9% A,B,C)
- **Corequisite with time + ALEKs**: 1.78 (42.1% D,F,W, 57.9% A,B,C)
- **Traditional Lecture with SI**: 2.20 (25.0% D,F,W, 75.0% A,B,C)

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### Comparison of Instructional Formats in MATH 1510, College Algebra

- **Traditional Lecture**: 1.95 (47.1% D,F,W, 52.9% A,B,C)
- **Corequisite with time + ALEKs**: 1.78 (42.1% D,F,W, 57.9% A,B,C)
- **Traditional Lecture with SI**: 2.20 (25.0% D,F,W, 75.0% A,B,C)
Youngstown State University
Department of Mathematics and Statistics
Course Outline for MATH 2623 (CRN 21439) and MATH 2623C (CRN 24827)

Course Titles: Quantitative Reasoning and Co-requisite Support of Quantitative Reasoning


Course Credit: 3 s.h. (counts toward graduation) + 2 s.h. lab (co-requisite)

Credit will not be given to both MATH 2623 and MATH 2625.

Course Description: Math 2623 is a General Education course and typically for students seeking a Bachelor’s of Arts degree requiring a ‘liberal-arts’ mathematics course, in addition to other majors such as Economics and Business.

Course Objectives: This course is designed to expand students’ abilities to think critically. Through class discussion, technology and working together in small groups, students can develop the following core skills referenced in the Ohio OTM Learning Outcomes for Quantitative Reasoning.

1. Interpret mathematical information presented in various forms (e.g., equations, graphs, diagrams, tables, words).
2. Represent and convert information from one mathematical form into another (e.g., equations, graphs, diagrams, tables, words).
3. Perform arithmetical and mathematical calculations.
4. Make and draw conclusions based on quantitative analysis.
5. Make and evaluate important assumptions in estimation, modeling, and data analysis.
6. Explain thoughts and processes in terms of the evidence used, how it is organized, presented, and contextualized.

Course Outcomes:

1. Numeracy: Students will develop and use the concepts of numeracy to investigate and explain quantitative relationships and solve problems in a variety of real-world contexts.

2. Mathematical Modeling: Students will make decisions by analyzing mathematical models, including situations in which the student must recognize and/or make assumptions.

3. Probability and Statistics: Students will use the language and structure of statistics and probability to investigate, represent, make decisions, and draw conclusions from real-world contexts.

The course outcomes and student skills will be achieved through various classroom activities and homework assignments. Classroom activities, supplied by the instructor, are taken from a variety of different sources/authors. Using and Understanding Mathematics – A Quantitative Reasoning Approach (any edition) by Bennett and Briggs.
## Course Syllabus

<table>
<thead>
<tr>
<th>Dates</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/09/2017 - 01/16/2017</td>
<td>1. Module 1 (1.1) (18 topics)</td>
</tr>
<tr>
<td>01/17/2017 - 01/22/2017</td>
<td>2. Module 2 (1.3-1.4) (19 topics)</td>
</tr>
<tr>
<td>01/23/2017 - 01/30/2017</td>
<td>3. Module 3 (1.6) (20 topics)</td>
</tr>
<tr>
<td>01/31/2017 - 02/05/2017</td>
<td>4. Module 4 (1.7) (18 topics)</td>
</tr>
<tr>
<td>02/06/2017 - 02/10/2017</td>
<td>5. Module 5 (3.6) (9 topics)</td>
</tr>
<tr>
<td>02/11/2017 - 02/13/2017</td>
<td>6. Module 6 (2.1,2.4) (24 topics)</td>
</tr>
<tr>
<td>02/14/2017 - 02/19/2017</td>
<td>7. Module 7 (2.4-2.5) (15 topics)</td>
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<tr>
<td>02/20/2017 - 02/26/2017</td>
<td>8. Module 8 (2.3-2.7) (25 topics)</td>
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<tr>
<td>02/27/2017 - 03/05/2017</td>
<td>9. Module 9 (2.6-2.7) (25 topics)</td>
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<td>03/06/2017 - 03/12/2017</td>
<td>10. Module 10 (2.6) (13 topics)</td>
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<td>03/13/2017 - 03/20/2017</td>
<td>11. Module 11 (2.8,4.1) (22 topics)</td>
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<tr>
<td>03/21/2017 - 03/26/2017</td>
<td>12. Module 12 (3.1-3.2) (19 topics)</td>
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<tr>
<td>03/27/2017 - 03/31/2017</td>
<td>13. Module 13 (3.3-3.4) (19 topics)</td>
</tr>
<tr>
<td>04/01/2017 - 04/06/2017</td>
<td>14. Module 14 (2.2,3.5) (15 topics)</td>
</tr>
<tr>
<td>04/07/2017 - 04/11/2017</td>
<td>15. Module 15 (4.2-4.3) (22 topics)</td>
</tr>
<tr>
<td>04/12/2017 - 04/17/2017</td>
<td>16. Module 16 (4.4-4.6) (20 topics)</td>
</tr>
<tr>
<td>04/18/2017 - 04/23/2017</td>
<td>17. Module 17 (5.1, 5.4) (9 topics)</td>
</tr>
<tr>
<td>04/24/2017 - 05/01/2017</td>
<td>18. Module 18 (7.1-7.3) (13 topics)</td>
</tr>
</tbody>
</table>

**Module 1 (1.1)** (18 topics, due on 01/16/2017)

- 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 linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- Solving a two-step equation with signed fractions
- Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
- Solving for a variable in terms of other variables using addition or subtraction: Basic
- Solving for a variable in terms of other variables using addition or subtraction: Advanced
- Solving for a variable in terms of other variables using multiplication or division: Basic
- Solving for a variable in terms of other variables using multiplication or division: Advanced
- Solving for a variable in terms of other variables using addition or subtraction with division
Solving for a variable inside parentheses in terms of other variables
Solving for a variable in terms of other variables in a linear equation with fractions
Solving a proportion of the form \(a/(x+b) = c/x\)
Solving a rational equation that simplifies to linear: Denominator \(x\)
Solving a rational equation that simplifies to linear: Denominator \(x+a\)
Solving a rational equation that simplifies to linear: Denominators \(a\), \(x\), or \(ax\)
Solving a rational equation that simplifies to linear: Denominators \(ax\) and \(bx\)

Module 2 (1.3-1.4) (19 topics, due on 01/22/2017)

- 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 written in factored form
- Finding the roots of a quadratic equation of the form \(ax^2 + bx = 0\)
- Finding the roots of a quadratic equation with leading coefficient 1
- Writing a quadratic equation given the roots and the leading coefficient
- 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
- Solving a quadratic equation with complex roots
- Discriminant of a quadratic equation

Module 3 (1.6) (20 topics, due on 01/30/2017)

- Introduction to solving an absolute value equation
- Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- Solving an absolute value equation: Problem type 1
- Solving an absolute value equation: Problem type 2
- Solving a rational equation that simplifies to linear: Like binomial denominators
- Solving a rational equation that simplifies to linear: Unlike binomial denominators
- Solving a quadratic equation needing simplification
- Roots of a product of polynomials
- Solving an equation using the odd-root property: Problem type 2
- Restriction on a variable in a denominator: Quadratic
- Solving a rational equation that simplifies to linear: Factorable quadratic denominator
- Solving a rational equation that simplifies to quadratic: Denominator \(x\)
- Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
- Introduction to solving a radical equation
- Solving a radical equation that simplifies to a linear equation: One radical, basic
- Solving a radical equation that simplifies to a linear equation: One radical, advanced
- Solving a radical equation that simplifies to a linear equation: Two radicals
- Solving a radical equation that simplifies to a quadratic equation: One radical, basic
- Solving an equation with positive rational exponent
- Solving an equation that can be written in quadratic form: Problem type 1

Module 4 (1.7) (18 topics, due on 02/05/2017)

- Solving equations with zero, one, or infinitely many solutions
- Graphing a linear inequality on the number line
- Writing an inequality given a graph on the number line
- Graphing a compound inequality on the number line
- Writing a compound inequality given a graph on the number line
- Set builder and interval notation
- Identifying solutions to a two-step linear inequality in one variable
- Solving a two-step linear inequality: Problem type 1
- Solving a two-step linear inequality: Problem type 2
- Solving a two-step linear inequality with a fractional coefficient
- Solving a linear inequality with multiple occurrences of the variable: Problem type 1
- Solving a linear inequality with multiple occurrences of the variable: Problem type 2
- Solving inequalities with no solution or all real numbers as solutions
- Solving a compound linear inequality: Graph solution, basic
• Solving a compound linear inequality: Interval notation
• Solving an absolute value inequality: Problem type 1
• Writing an absolute value inequality given a graph on the number line
• Solving an absolute value inequality: Problem type 2

Module 5 (3.6)  (9 topics, due on 02/10/2017)

• Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators
• Solving a quadratic inequality written in factored form
• Solving a quadratic inequality
• Solving a polynomial inequality: Problem type 1
• Solving a polynomial inequality: Problem type 2
• Solving a polynomial inequality: Problem type 3
• Solving a polynomial inequality: Problem type 4
• Solving a rational inequality: Problem type 1
• Solving a rational inequality: Problem type 2

Module 6 (2.1,2.4)  (24 topics, due on 02/13/2017)

• Reading a point in the coordinate plane
• Plotting a point in the coordinate plane
• Table for a linear equation
• Distance between two points in the plane: Exact answers
• Midpoint of a line segment in the plane
• 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: Basic
• Finding $x$- and $y$-intercepts of a line given the equation: Advanced
• Finding $x$- and $y$-intercepts of the graph of a nonlinear equation
• 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 given its slope and $y$-intercept
• Graphing a line through a given point with a given slope
• Writing an equation in point-slope form given the slope and a point
• Writing an equation of a line given the $y$-intercept and another point
• Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
• Finding slopes of lines parallel and perpendicular to a line given in the form $Ax + By = C$
• Identifying parallel and perpendicular lines from equations
• Writing equations of lines parallel and perpendicular to a given line through a point

Module 7 (2.4-2.5)  (15 topics, due on 02/19/2017)

• 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 of a line given its slope and $y$-intercept
• Writing an equation in slope-intercept form given the slope and a point
• Finding the slope and a point on a line given its equation in point-slope form
• Writing an equation in point-slope 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
• Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
• Finding slopes of lines parallel and perpendicular to a line given in the form $Ax + By = C$
• Identifying parallel and perpendicular lines from equations
• Writing equations of lines parallel and perpendicular to a given line through a point
• Solving a linear equation by graphing

Module 8 (2.3-2.7)  (25 topics, due on 02/26/2017)

• Identifying solutions to a linear equation in two variables
• Finding $x$- and $y$-intercepts given the graph of a line on a grid
• Finding intercepts of a nonlinear function given its graph
• Graphing a parabola of the form $y = ax^2$
- Graphing a parabola of the form \( y = ax^2 + c \)
- Identifying functions from relations
- Vertical line test
- Table for a linear function
- Evaluating functions: Linear and quadratic or cubic
- Evaluating a rational function: Problem type 1
- Evaluating a rational function: Problem type 2
- Table for a square root function
- Evaluating functions: Absolute value, rational, radical
- Evaluating a piecewise-defined function
- Domain of a rational function: Excluded values
- Domain of a rational function: Interval notation
- Domain of a square root function: Basic
- Domain of a square root function: Advanced
- Finding the domain of a fractional function involving radicals
- Determining whether an equation defines a function: Basic
- 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 continuous function
- Domain and range from the graph of a piecewise function
- Domain and range from the graph of a quadratic function

**Module 9 (2.6-2.7)** (25 topics, due on 03/05/2017)

- Graphing an absolute value equation of the form \( y = A|x| \)
- Graphing a cubic function of the form \( y = ax^3 \)
- Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin
- Evaluating a cube root function
- Variable expressions as inputs of functions: Problem type 1
- 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
- Graphing a function of the form \( f(x) = ax + b \): Integer slope
- Graphing a function of the form \( f(x) = ax + b \): Fractional slope
- Graphing an absolute value equation in the plane: Basic
- Graphing an absolute value equation in the plane: Advanced
- Graphing a function of the form \( f(x) = ax^2 \)
- Graphing a function of the form \( f(x) = ax^2 + c \)
- Graphing a parabola of the form \( y = (x-h)^2 + k \)
- Graphing a square root function: Problem type 1
- Graphing a square root function: Problem type 2
- Graphing a square root function: Problem type 3
- Graphing a cube root function
- Matching parent graphs with their equations
- Graphing a piecewise-defined function: Problem type 1
- Even and odd functions: Problem type 1
- Even and odd functions: Problem type 2
- Writing an equation for a function after a vertical translation
- Writing an equation for a function after a vertical and horizontal translation

**Module 10 (2.6)** (13 topics, due on 03/12/2017)

- Graphing a square root function: Problem type 2
- Graphing a cube root function
- Translating the graph of a parabola: One step
- Translating the graph of a parabola: Two steps
- Translating the graph of an absolute value function: One step
- Translating the graph of an absolute value function: Two steps
- Translating the graph of a function: One step
- Translating the graph of a function: Two steps
- Transforming the graph of a function by reflecting over an axis
- Transforming the graph of a function by shrinking or stretching
- Transforming the graph of a function using more than one transformation
- Transforming the graph of a quadratic, cubic, square root, or absolute value function
- Writing an equation for a function after a vertical and horizontal translation

**Module 11 (2.8,4.1)** (22 topics, due on 03/20/2017)

- Translating the graph of a function: Two steps
- Writing an equation for a function after a vertical and horizontal translation
- Solving for a variable in terms of other variables in a rational equation: Problem type 1
- Solving for a variable in terms of other variables in a rational equation: Problem type 2
- Algebraic symbol manipulation with radicals
- Solving an equation with a root index greater than 2: Problem type 1
- Solving an equation with a root index greater than 2: Problem type 2
- Variable expressions as inputs of functions: Problem type 2
- Finding a difference quotient for a linear or quadratic function
- Sum, difference, and product of two functions
- Quotient of two functions: Basic
- Combining functions: Advanced
- Introduction to the composition of two functions
- Composition of two functions: Basic
- Composition of a function with itself
- Expressing a function as a composition of two functions
- Composition of two functions: Domain and range
- Horizontal line test
- Determining whether two functions are inverses of each other
- Inverse functions: Linear, discrete
- Inverse functions: Quadratic, square root
- Inverse functions: Cubic, cube root
- Inverse functions: Rational
- Graphing the inverse of a function given its graph

**Module 12 (3.1-3.2)** (19 topics, due on 03/26/2017)

- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
- Graphing a parabola of the form \( y = (x-h)^2 + k \)
- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- 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
- Finding the zeros of a quadratic function given its equation
- Rewriting a quadratic function to find its vertex and sketch its graph
- Finding the maximum or minimum of a quadratic function
- Domain and range from the graph of a quadratic function
- Writing the equation of a quadratic function given its graph
- Finding zeros of a polynomial function written in factored form
- Finding zeros and their multiplicities given a polynomial function written in factored form
- 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

**Module 13 (3.3-3.4)** (19 topics, due on 03/31/2017)

- Writing a quadratic function given its zeros
- Finding a polynomial of a given degree with given zeros: Real zeros
- Polynomial long division: Problem type 1
- Polynomial long division: Problem type 2
- Polynomial long division: Problem type 3
- Synthetic division
- 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
- Using the conjugate zeros theorem to find all zeros of a polynomial
- Linear factors theorem and conjugate zeros theorem

**Module 14 (2.2,3.5)** (15 topics, due on 04/06/2017)
- Identifying the center and radius to graph a circle given its equation in standard form
- Identifying the center and radius to graph a circle given its equation in general form: Basic
- Identifying the center and radius to graph a circle given its equation in general form: Advanced
- Writing the equation of a circle centered at the origin given its radius or a point on the circle
- Writing an equation of a circle given its center and radius or diameter
- 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
- Translating the graph of a rational function
- Matching graphs with rational functions: Two vertical asymptotes

Module 15 (4.2-4.3) (22 topics, due on 04/11/2017)

- Table for an exponential function
- Graphing an exponential function: \( f(x) = b^x \)
- Graphing an exponential function: \( f(x) = a(b)^x \)
- Graphing an exponential function: \( f(x) = b^{-x} \) 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
- Using a calculator to evaluate exponential expressions involving base \( e \)
- Introduction to 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
- 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
- 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

Module 16 (4.4-4.6) (20 topics, due on 04/17/2017)

- Evaluating an exponential function that models a real-world situation
- Evaluating an exponential function with base \( e \) that models a real-world situation
- Writing an equation that models exponential growth or decay
- Solving an equation of the form \( \log_b a = c \)
- Basic properties of logarithms
- Expanding a logarithmic expression: Problem type 1
- Expanding a logarithmic expression: Problem type 2
- Writing an expression as a single logarithm
- 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 exponential equation by finding common bases: Linear exponents
- Solving an exponential equation by using logarithms: Decimal answers, basic
- Solving an exponential equation by using natural logarithms: Decimal answers
- 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 half-life or doubling time

Module 17 (5.1, 5.4) (9 topics, due on 04/23/2017)

- Identifying solutions to a system of linear equations
- Graphically solving a system of linear equations
• Solving a system of linear equations using substitution
• Solving a system of linear equations using elimination with addition
• Solving a system of linear equations using elimination with multiplication and addition
• Solving a value mixture problem using a system of linear equations
• Graphically solving a system of linear and quadratic equations
• Solving a system of linear and quadratic equations
• Solving a system of nonlinear equations: Problem type 1

Module 18 (7.1-7.3)  (13 topics, due on 05/01/2017)

- Graphing a parabola of the form \( y^2 = ax \) or \( x^2 = ay \)
- Graphing a parabola of the form \( x = a(y-k)^2 + h \) or \( y = a(x-h)^2 + k \)
- Writing an equation of a parabola given the vertex and the focus
- Writing an equation of a parabola given the focus and the directrix
- Word problem involving a parabola
- Graphing an ellipse given its equation in standard form
- Graphing an ellipse centered at the origin: \( Ax^2 + By^2 = C \)
- Graphing an ellipse given its equation in general form
- Finding the foci of an ellipse given its equation in general form
- Graphing a hyperbola given its equation in standard form
- Graphing a hyperbola centered at the origin: \( Ax^2 - By^2 = C \)
- Graphing a hyperbola given its equation in general form
- Finding the foci of a hyperbola given its equation in general form
Grading Policy and Office Hours  
For  
Math 2623 and Math 2623C

Term: Spring 2017  
Course CRN’s: 21439 and 24827  
Instructor: Dr. Richard G. Goldthwait  
Office: 532 Lincoln  
Office Hours: MW 11 – 12 ; TTh 2 – 3 (or by appointment)  
Phone: (330) 941-1813

Grading Criteria

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>50</td>
</tr>
<tr>
<td>Test 2</td>
<td>50</td>
</tr>
<tr>
<td>In-Class Activities</td>
<td>50</td>
</tr>
<tr>
<td>Assignments</td>
<td>50</td>
</tr>
<tr>
<td>Quizzes</td>
<td>50</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
</tbody>
</table>

A: 90 – 100 %   B: 80 – 89 %   C: 70 – 79 %   D: 60 - 69 %

For the course grade, the student can receive no worse than one letter grade less than the grade earned on the Final Exam.

All tests and quizzes are closed book, closed notes.

Cell Phone Policy

Cell phones are to be silenced during class. If you need to text or talk on your phone in an emergency, you may briefly leave the classroom to do so.

During exams, phones must be turned off, put away, and out of sight. Under no circumstance may a phone be taken out and used during an exam or quiz.

Make Up Policy

I must be notified within 24 hours of having given the test or quiz to the class. (This can be done by contacting the Math Office (x3302) and leaving a message or by contacting me directly.)
The math skills on which the course activities depend are found in the following chapters of *Using and Understanding Mathematics – A Quantitative Reasoning Approach* (any edition) by Bennett and Briggs. (Based on sixth edition – some differences with older editions.)

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Logic and Critical Thinking</td>
</tr>
<tr>
<td>2</td>
<td>Units and Problem Solving</td>
</tr>
<tr>
<td>3</td>
<td>Ratio and Percentage</td>
</tr>
<tr>
<td>4</td>
<td>Compound Interest, Loans, Sinking Funds</td>
</tr>
<tr>
<td>5</td>
<td>Histograms, Bar Graphs, Line Graphs, Sampling</td>
</tr>
<tr>
<td>6</td>
<td>Mean, Median, Standard Deviation, Normal Distribution</td>
</tr>
<tr>
<td>7</td>
<td>Counting, Probability</td>
</tr>
<tr>
<td>9</td>
<td>Linear Modeling, Exponential Modeling</td>
</tr>
</tbody>
</table>

**Grading:** See your instructor’s grading policy

**Students with Disabilities:** Youngstown State University is committed to providing reasonable accommodations for all persons with disabilities. This syllabus is available in alternative format upon request. In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course, please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress Disability Services, located at 275 Fifth Avenue, and provide a letter of accommodation to coordinate reasonable accommodations. You can reach CSP Disability Services at 330-941-1372.

Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit www.ysu.edu/ada-accessibility for contact information for persons designated to handle questions about this policy.

**Class Cancellation Notice:** If this class is being cancelled for any one day because of instructor illness, or other reasons, will be sent to the student address <…@student.ysu.edu> as soon as possible.

**Semester:** Spring 2017

**Legal Holidays:** Martin Luther King Day: Monday, January 16

**Spring Break:** Monday, March 6 - Sunday, March 12

**The last day to drop the course with a grade of “W”:** Thursday, March 23

**Term Ends:** Saturday, May 6

**Mathematics Assistance Center (MAC):** For all your mathematics needs:
- Tutoring
Mathematics Assistance Center

Location: Lincoln Building / Room 408
Website: http://web.ysu.edu/stem/mac
E-mail: mathassist@math.ysu.edu
Phone: 330-941-3274
Hours: Monday – Thursday 9:00 am – 5:00 pm
     Friday 9:00 am – 3:00 pm

Check for services available for your course.
MATH 1510
College Algebra
Spring 2017

Instructor: Mrs. Eleanor Klucinec, MS in Education, MS in Mathematics

Office: Lincoln 634

Email: esklucinec@ysu.edu

Office hours: Lincoln 634 – M/W 9:00-10:00, Thursday 8:00-10:00, or by appointment

Class Meeting Time & Place: MTWF 8:00-8:50 AM, AND TF 9:00-9:50AM, Lincoln 404

Textbook: Miller and Gerken, College Algebra, 2nd edition

Content and Purpose: This course is primarily intended to prepare STEM students (along with MATH 1511) for MATH 1570 or 1571 and business students for MATH 1552. Topics include real numbers, equations and inequalities, linear, quadratic, polynomial, exponential, and logarithmic functions, graphing techniques, systems of equations, and applications. The course fulfills the general education requirements for mathematics.

Prereq.: MATH 1505 or MATH 1507 with a "C" or better or Math Placement Level 35 or higher.

Getting help: You can reach me by sending an email in order to schedule a meeting time outside of my listed office hours. Please email me at least two days in advance so that I can schedule the time and reply to the email. My responses will generally be sent out early in the morning. Also, the Mathematics Assistance Center (MAC) can be found in the Lincoln building, room 408. They are open from 9:00-5:00 (Monday-Thursday) and 9:00-3:00 (Friday). Here you will find many tutors that are prepared to help you with the course material. The MAC also has solution manuals, computers, and many other services to help you with your studies.

Grading: Grades in this course will be based on the following weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight (Percentage)</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Exams</td>
<td>20% (48 points each)</td>
<td></td>
</tr>
<tr>
<td>Comprehensive final exam</td>
<td>30% (216 points)</td>
<td></td>
</tr>
<tr>
<td>9 Quizzes</td>
<td>15% (12 points each)</td>
<td></td>
</tr>
<tr>
<td>Pie Progress</td>
<td>10% (72 points)</td>
<td></td>
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<tr>
<td>Objectives</td>
<td>25% (180 points)</td>
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<td></td>
<td></td>
<td>(720 total points)</td>
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</tbody>
</table>

The following grading scale will be used:

- 100-90% A (720-644.4 pts)
- 89-80% B (644.3-572.4 pts)
- 79-70% C (572.3-500.4 pts)
- 69-60% D (500.3-428.4 pts)
- 59-0% F (less than 428.3 pts)

Exams: There will be 3 exams and a final. It is expected that all students be present for all exams and for the final exam. If you must miss an exam because of a university-sponsored event, be sure to contact me in advance. In order to make up a missed exam, you will be required to furnish proof of the reason which is sufficient in the judgment of the instructor. An unexcused absence from class on the day of an exam, will result in a grade of 0 on that exam. The final exam is comprehensive.

Tentative Exam Dates:

- Exam 1: Friday, February 3
- Exam 2: Friday, March 3
- Exam 3: Friday, April 7
- Final Exam: Wednesday, May 3 3:15PM-5:15PM
Other important dates: The University will be closed on Monday, January 16. Spring break is March 6-March 10, 2017.

Quizzes: Quizzes will be given every Friday to gauge your understanding of the concepts discussed to that point. Make-up quizzes will not be given! At the end of the semester, your 2 lowest quiz grades will be dropped.

Homework: Homework is your responsibility and must be done on your own time and during Lab hours. All homework assignments are on ALEKS, and each module has a due date. You may ask for help on any problem at the beginning of each class.

ALEKS: We will be using ALEKS for all homework. Enrollment into ALEKS is free using the class code RHGTU-M9HNH.

Technology: In addition to the calculator provided by ALEKS, a scientific calculator may be used in this course. A graphing calculator, however, is not permitted. Furthermore, no cell phones or headphones are allowed in class. They are a distraction to the instructor as well as your classmates. You will be asked to leave the class if this policy is violated. Finally, if you are using an iPad for something other than class notes, you will be asked not to bring it to class anymore.

Attendance and class participation: Attendance will be taken at each class meeting. Any student not attending class regularly will have a difficult time passing this course. All students are expected to participate in class. Mathematics is not a spectator sport.

Students with disabilities: In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course; please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress Disability Services, located at 36 West Wood Street, and provide a letter of accommodation to coordinate reasonable accommodations. You can reach CSP Disability Services at 330-941-1372.

University Non-Discrimination Policy: Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit www.ysu.edu/ada-accessibility for contact information for persons designated to handle questions about this policy.

Plagiarism and Cheating: Academic honesty is expected. Cheating on exams, plagiarism, or any kind of unethical behavior may subject the student to severe academic penalties including expulsion.

Class Cancellation: If class is cancelled, an email will be sent to your YSU email address.
MATH 1510 ALEKS Co-requisite Model
MTWF 8-8:50am (Lecture), T/R 9-9:50am (Lab)  
Course Code: E4NXN-YQQQQ

ALEKS Course: College Algebra  
Instructor: Mrs. Eleanor Klucinec

Course Dates: Begin: 1/9/17  End: 5/1/2017  
Course Content: 300 topics

Textbook: Miller/Gerken: College Algebra, 2nd Ed. (McGraw-Hill) - ALEKS 360

<table>
<thead>
<tr>
<th>Due Dates</th>
<th>Objective</th>
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<tbody>
<tr>
<td>TBA</td>
<td>1. Module 1 (1.1) (17 topics)</td>
</tr>
<tr>
<td>TBA</td>
<td>2. Module 2 (1.3-1.4) (19 topics)</td>
</tr>
<tr>
<td>TBA</td>
<td>3. Module 3 (1.6) (17 topics)</td>
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<tr>
<td>TBA</td>
<td>4. Module 4 (1.7) (19 topics)</td>
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<td>TBA</td>
<td>5. Module 5 (3.6) (7 topics)</td>
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<tr>
<td>TBA</td>
<td>6. Module 6 (2.1,2.4) (19 topics)</td>
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<tr>
<td>TBA</td>
<td>7. Module 7 (2.4-2.5) (16 topics)</td>
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<tr>
<td>TBA</td>
<td>8. Module 8 (2.3-2.7) (25 topics)</td>
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<td>TBA</td>
<td>9. Module 9 (2.6-2.7) (19 topics)</td>
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<td>TBA</td>
<td>10. Module 10 (2.6) (10 topics)</td>
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<td>TBA</td>
<td>11. Module 11 (2.8,4.1) (21 topics)</td>
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<td>TBA</td>
<td>12. Module 12 (3.1-3.2) (17 topics)</td>
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<td>TBA</td>
<td>13. Module 13 (3.3-3.4) (18 topics)</td>
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<td>TBA</td>
<td>14. Module 14 (2.2,3.5) (14 topics)</td>
</tr>
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<td>TBA</td>
<td>15. Module 15 (4.2-4.3) (21 topics)</td>
</tr>
<tr>
<td>TBA</td>
<td>16. Module 16 (4.4-4.6) (19 topics)</td>
</tr>
<tr>
<td>TBA</td>
<td>17. Module 17 (5.1, 5.4) (8 topics)</td>
</tr>
<tr>
<td>TBA</td>
<td>18. Module 18 (7.1-7.3) (5 topics)</td>
</tr>
</tbody>
</table>

**Module 1 (1.1) (17 topics, due on TBA)**

- 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 two distributions
- Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
- Solving for a variable in terms of other variables using addition or subtraction: Basic Solving for a variable
- Solving for a variable in terms of other variables using addition or subtraction: Advanced Solving for a variable
- Solving for a variable in terms of other variables using multiplication or division: Basic Solving for a variable
- Solving for a variable in terms of other variables using multiplication or division: Advanced Solving for a variable

Copyright © 2016 UC Regents and ALEKS Corporation. ALEKS is a registered trademark of ALEKS Corporation.
• Solving for a variable in terms of other variables using addition or subtraction with division
• Solving for a variable inside parentheses in terms of other variables
• Solving for a variable in terms of other variables in a linear equation with fractions
• Solving a rational equation that simplifies to linear: Denominator x
• Solving a rational equation that simplifies to linear: Denominator x+a
• Solving a rational equation that simplifies to linear: Denominators a, x, or ax
• Solving a rational equation that simplifies to linear: Denominators ax and bx

Module 2 (1.3-1.4)  (19 topics, due on TBA)
• 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 written in factored form
• Finding the roots of a quadratic equation of the form ax^2 + bx = 0
• Finding the roots of a quadratic equation with leading coefficient 1
• Finding the roots of a quadratic equation with leading coefficient greater than 1
• Writing a quadratic equation given the roots and the leading coefficient
• 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
• Solving a quadratic equation with complex roots
• Discriminant of a quadratic equation

Module 3 (1.6)  (17 topics, due on TBA)
• Introduction to solving an absolute value equation
• Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
• Solving an absolute value equation: Problem type 1
• Solving an absolute value equation: Problem type 2
• Solving a rational equation that simplifies to linear: Like binomial denominators
• Solving a rational equation that simplifies to linear: Unlike binomial denominators
• Solving a quadratic equation needing simplification
• Roots of a product of polynomials
• Solving an equation using the odd-root property: Problem type 2
• Restriction on a variable in a denominator: Quadratic
• Solving a rational equation that simplifies to linear: Factorable quadratic denominator
• Solving a rational equation that simplifies to quadratic: Denominator x
• Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
• Introduction to solving a radical equation
• Solving a radical equation that simplifies to a linear equation: One radical, basic
• Solving a radical equation that simplifies to a linear equation: One radical, advanced
• Solving a radical equation that simplifies to a linear equation: Two radicals

Module 4 (1.7)  (19 topics, due on TBA)
• Solving equations with zero, one, or infinitely many solutions
• Graphing a linear inequality on the number line
• Writing an inequality given a graph on the number line
• Graphing a compound inequality on the number line
• Writing a compound inequality given a graph on the number line
• Set builder and interval notation
• Identifying solutions to a two-step linear inequality in one variable
• Solving a two-step linear inequality: Problem type 1
• Solving a two-step linear inequality: Problem type 2
• Solving a two-step linear inequality with a fractional coefficient
• Solving a linear inequality with multiple occurrences of the variable: Problem type 1
• Solving a linear inequality with multiple occurrences of the variable: Problem type 2
• Solving inequalities with no solution or all real numbers as solutions
• Solving a compound linear inequality: Graph solution, basic
• Solving a compound linear inequality: Interval notation
• Solving an absolute value inequality: Problem type 1
• Writing an absolute value inequality given a graph on the number line
Module 5 (3.6)  (7 topics, due on TBA)

- Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators
- Solving a quadratic equation written in factored form
- Solving a quadratic inequality
- Solving a polynomial inequality: Problem type 1
- Solving a polynomial inequality: Problem type 2
- Solving a rational inequality: Problem type 1
- Solving a rational inequality: Problem type 2

Module 6 (2.1,2.4)  (19 topics, due on TBA)

- Reading a point in the coordinate plane
- Plotting a point in the coordinate plane
- Table for a linear equation
- Distance between two points in the plane: Exact answers
- Midpoint of a line segment in the plane
- 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: Basic Finding
- x- and y-intercepts of a line given the equation: Advanced Finding x- and y-intercepts of the graph of a nonlinear equation Classifying slopes given graphs of lines
- 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 given its slope and y-intercept
- Finding a line through a given point with a given slope

Module 7 (2.4-2.5)  (16 topics, due on TBA)

- Graphing a vertical or horizontal line
- 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 of a line given its slope and y-intercept
- Writing an equation in slope-intercept form given the slope and a point Finding the slope and a point on a line given its equation in point-slope form Writing an equation in point-slope 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
- Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
- Finding slopes of lines parallel and perpendicular to a line given in the form Ax + By = C
- Identifying parallel and perpendicular lines from equations
- Writing equations of lines parallel and perpendicular to a given line through a point
- Solving a linear equation by graphing

Module 8 (2.3-2.7)  (25 topics, due on TBA)

- Identifying solutions to a linear equation in two variables Finding x- and y-intercepts given the graph of a line on a grid Finding intercepts of a nonlinear function given its graph Graphing a parabola of the form y = ax^2
- Graphing a parabola of the form y = ax^2 + c
- Identifying functions from relations
- Vertical line test
- Table for a linear function
- Evaluating functions: Linear and quadratic or cubic
- Evaluating a rational function: Problem type 1
- Evaluating a rational function: Problem type 2
- Table for a square root function
• Evaluating functions: Absolute value, rational, radical
• Evaluating a piecewise-defined function Domain
• of a rational function: Excluded values Domain of
• a rational function: Interval notation Domain of a
• square root function: Basic Domain of a square
• root function: Advanced
• Finding the domain of a fractional function involving radicals
• Determining whether an equation defines a function: Basic
• 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 continuous function Domain and
• range from the graph of a piecewise function Domain and
• range from the graph of a quadratic function

Module 9 (2.6-2.7) (19 topics, due on TBA)

• Graphing an absolute value equation of the form \( y = A|x| \)
• Graphing a cubic function of the form \( y = ax^3 \)
• Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin
• Evaluating a cube root function
• Variable expressions as inputs of functions: Problem type 1
• 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
• Graphing a function of the form \( f(x) = ax + b \): Integer slope
• Graphing a function of the form \( f(x) = ax + b \): Fractional slope
• Graphing an absolute value equation in the plane: Basic Graphing
• a function of the form \( f(x) = ax^2 \)
• Graphing a function of the form \( f(x) = ax^2 + c \)
• Graphing a parabola of the form \( y = (x-h)^2 + k \)
• Graphing a square root function: Problem type 1
• Graphing a square root function: Problem type 2
• Graphing a cube root function
• Matching parent graphs with their equations
• Graphing a piecewise-defined function: Problem type 1
• Even and odd functions: Problem type 1

Module 10 (2.6) (10 topics, due on TBA)

• Translating the graph of a parabola: One step
• Translating the graph of a parabola: Two steps
• Translating the graph of an absolute value function: One step
• Translating the graph of an absolute value function: Two steps
• Translating the graph of a function: One step
• Translating the graph of a function: Two steps
• Transforming the graph of a function by reflecting over an axis Transforming
• the graph of a function by shrinking or stretching Transforming the graph of a
• function using more than one transformation
• Transforming the graph of a quadratic, cubic, square root, or absolute value function

Module 11 (2.8,4.1) (21 topics, due on TBA)

• Solving for a variable in terms of other variables in a rational equation: Problem type 1
• Solving for a variable in terms of other variables in a rational equation: Problem type 2
• Algebraic symbol manipulation with radicals
• Solving an equation with a root index greater than 2: Problem type 1
• Solving an equation with a root index greater than 2: Problem type 2
• Variable expressions as inputs of functions: Problem type 2
• Finding a difference quotient for a linear or quadratic function
• Sum, difference, and product of two functions
• Quotient of two functions: Basic
• Combining functions: Advanced
• Introduction to the composition of two functions
• Composition of two functions: Basic Composition
• of a function with itself
• Expressing a function as a composition of two functions
• Horizontal line test
• Determining whether two functions are inverses of each other
• Inverse functions: Linear, discrete
Inverse functions: Quadratic, square root
Inverse functions: Cubic, cube root, inverse
functions: Rational
Graphing the inverse of a function given its graph

Module 12 (3.1-3.2)  (17 topics, due on TBA)
- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
- Graphing a parabola of the form \( y = (x-h)^2 + k \)
- Finding the vertex, x-intercepts, and axis of symmetry from the graph of a parabola
- 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
- Finding the zeros of a quadratic function given its equation: 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
- Writing the equation of a quadratic function given its graph
- Finding zeros of a polynomial function written in factored form
- Finding zeros and their multiplicities given a polynomial function written in factored form
- 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

Module 13 (3.3-3.4)  (18 topics, due on TBA)
- Writing a quadratic function given its zeros
- Finding a polynomial of a given degree with given zeros: Real zeros
- Polynomial long division: Problem type 1
- Polynomial long division: Problem type 2
- Polynomial long division: Problem type 3
- Synthetic division
- 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 Using the conjugate zeros theorem to find all zeros of a polynomial

Module 14 (2.2,3.5)  (14 topics, due on TBA)
- Identifying the center and radius to graph a circle given its equation in standard form
- Identifying the center and radius to graph a circle given its equation in general form: Basic Writing the equation of a circle centered at the origin given its radius or a point on the circle: Writing an equation of a circle given its center and radius or diameter
- Writing an equation of a circle given its center and a point on the circle
- 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
- Matching graphs with rational functions: Two vertical asymptotes

Module 15 (4.2-4.3)  (21 topics, due on TBA)
- Table for an exponential function
- Graphing an exponential function: \( f(x)=b^x \)
Graphing an exponential function: \( f(x) = a(b)^x \)
Graphing an exponential function: \( f(x) = \begin{cases} b^x & \text{if } x < 0 \\ b^{x-k} & \text{if } x \geq 0 \end{cases} \)
Finding domain and range from the graph of an exponential function
Finding domain and range from the graph of an exponential function Transferring the graph of a natural exponential function
Graphing an exponential function and its asymptote: \( f(x) = a(e)^{b+c} \)
Using a calculator to evaluate exponential expressions
Using a calculator to evaluate exponential expressions involving base e
Introduction to 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
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
Translating the graph of a logarithmic function
Graphing a logarithmic function: Basic
The graph, domain, and range of a logarithmic function

Module 16 (4.4-4.6) (19 topics, due on TBA)
- Evaluating an exponential function that models a real-world situation
- Evaluating an exponential function with base e that models a real-world situation
- Solving an equation of the form \( \log_{b^c} = c \)
- Basic properties of logarithms
- Expanding a logarithmic expression: Problem type 1
- Expanding a logarithmic expression: Problem type 2
- Writing an expression as a single logarithm
- 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 exponential equation by finding common bases: Linear exponents
- Solving an exponential equation by using logarithms: Decimal answers, basic
- Solving an exponential equation by using natural logarithms: Decimal answers
- 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 half-life or doubling time

Module 17 (5.1, 5.4) (8 topics, due on TBA)
- Identifying solutions to a system of linear equations
- Graphically solving a system of linear equations
- Solving a system of linear equations using substitution
- Solving a system of linear equations using elimination with addition
- Solving a system of linear equations using elimination with multiplication and addition
- Graphically solving a system of linear and quadratic equations
- Solving a system of linear and quadratic equations
- Solving a system of nonlinear equations: Problem type 1

Module 18 (7.1-7.3) (5 topics, due on TBA)
- Graphing a parabola of the form \( y^2 = ax \) or \( x^2 = ay \)
- Graphing an ellipse given its equation in standard form
- Graphing an ellipse centered at the origin: \( Ax^2 + By^2 = C \)
- Graphing a hyperbola given its equation in standard form
- Graphing a hyperbola centered at the origin: \( Ax^2 + By^2 = C \)
## Course Syllabus

<table>
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<th>Trigonometry with Corequisite Support</th>
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<td>N3MGV-THTXQ</td>
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<tr>
<td>ALEKS Course:</td>
<td>College Algebra with Trigonometry</td>
</tr>
<tr>
<td>Instructor:</td>
<td>Mr. Williams</td>
</tr>
<tr>
<td>Course Dates:</td>
<td>Begin: 01/09/2017 End: 05/13/2017</td>
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**Course Content:**
- 336 Topics (306 goal + 30 prerequisite)
- 221 accessible topics

**Textbook:** Miller: College Algebra & Trigonometry, 1st Ed. (McGraw-Hill) - ALEKS 360

### Dates and Objective

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<td>20. Module #20 (8.3 &amp; 8.4) (25 topics)</td>
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**Accessible Topic** - Topics accessible to visually impaired students using a screen reader.

### Prerequisite Topics
- Using distribution with double negation and combining like terms to simplify: Multivariate
- Simplifying a sum or difference of two univariate polynomials

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Module #1 (R6 & R Supp.) (60 topics, due on 01/17/2017)

- Multiplying a univariate polynomial by a monomial with a positive coefficient
- Introduction to the GCF of two monomials
- Factoring out a monomial from a polynomial: Univariate
- Factoring a quadratic with leading coefficient 1
- Multiplying rational expressions involving multivariate monomials
- Introduction to the LCM of two monomials
- Finding the LCD of rational expressions with linear denominators: Relatively prime
- Adding rational expressions with denominators ax and bx: Advanced
- Adding rational expressions with linear denominators without common factors: Basic
- Introduction to solving an absolute value equation
- Simplifying the square root of a whole number less than 100
- Introduction to simplifying a radical expression with an odd exponent
- Introduction to simplifying a higher radical expression
- Introduction to square root addition or subtraction
- Square root multiplication: Advanced
- Introduction to simplifying a product of radical expressions: Univariate
- Simplifying a product of radical expressions: Univariate
- Additive property of equality with signed fractions
- Solving a two-step equation with signed fractions
- Identifying solutions to a linear equation in two variables
- Graphing a line given its equation in slope-intercept form: Fractional slope
- Graphing a line given its equation in standard form
- Finding x- and y-intercepts of a line given the equation: Basic
- Finding slope given the graph of a line on a grid
- Finding slope given two points on the line
- Finding the slope and y-intercept of a line given its equation in the form y = mx + b
- Writing an equation of a line given its slope and y-intercept
- Writing an equation in slope-intercept form given the slope and a point

- Ordering integers
- Signed fraction addition or subtraction: Basic
- Signed fraction subtraction involving double negation
- Addition and subtraction of 3 fractions involving signs
- Signed fraction multiplication: Basic
- Signed fraction division
- Exponents and signed fractions
- Order of operations with integers
- Evaluating a linear expression: Integer multiplication with addition or subtraction
- Distributive property: Integer coefficients
- Using distribution and combining like terms to simplify: Univariate
- Product rule with positive exponents: Univariate
- Product rule with positive exponents: Multivariate
- Power rules with positive exponents: Multivariate products
- Power and product rules with positive exponents
- Simplifying a ratio of multivariate monomials: Advanced
- Multiplying binomials with leading coefficients of 1
- Multiplying binomials with leading coefficients greater than 1
- Multiplying conjugate binomials: Univariate
- Squaring a binomial: Univariate
- Introduction to simplifying a radical expression with an even exponent
- Square root of a perfect square monomial
- Cube root of an integer
- Finding the \( n^{th} \) root of a perfect \( n^{th} \) power fraction
- Finding the \( n^{th} \) root of a perfect \( n^{th} \) power monomial
- Simplifying the square root of a whole number greater than 100
- Simplifying a radical expression with an even exponent
- Simplifying a radical expression with an odd exponent
- Simplifying a radical expression with two variables
- Simplifying a higher root of a whole number
- Simplifying a higher radical expression: Univariate
- Simplifying a higher radical expression: Multivariate
- Square root addition or subtraction
- Introduction to simplifying a sum or difference of radical expressions: Univariate
- Introduction to square root multiplication
- Square root multiplication: Basic
- Simplifying a product of radical expressions: Multivariate
- Introduction to simplifying a product of higher roots
• Simplifying a product of higher radical expressions
• Introduction to simplifying a product involving square roots using the distributive property
• Simplifying a product involving square roots using the distributive property: Basic
• Simplifying a product involving square roots using the distributive property: Advanced
• Special products of radical expressions: Conjugates and squaring
• Simplifying a quotient of square roots
• Simplifying a quotient involving a sum or difference with a square root
• Rationalizing a denominator: Quotient involving square roots
• Rationalizing a denominator: Square root of a fraction
• Rationalizing a denominator: Quotient involving a monomial
• Rationalizing a denominator using conjugates: Integer numerator
• Rationalizing a denominator using conjugates: Square root in numerator
• Rationalizing a denominator using conjugates: Variable in denominator
• Rationalizing a denominator: Quotient involving a higher radical
• Rationalizing a denominator: Quotient involving higher radicals and monomials
• Area of a triangle
• Area of a parallelogram
• Circumference of a circle
• Circumference and area of a circle: Exact answers in terms of pi
• Graphing a linear inequality on the number line
• Graphing a compound inequality on the number line

Module #2 (5.1)  (17 topics, due on 01/24/2017)

• Multiplicative property of equality with signed fractions
• 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 for a variable in terms of other variables using addition or subtraction: Advanced
• Solving a distance, rate, time problem using a linear equation
• Graphing a linear equation of the form y = mx
• Graphing a line given its equation in slope-intercept form: Integer slope
• Converting degrees-minutes-seconds to decimal degrees
• Converting a decimal degree to degrees-minutes-seconds
• Sketching an angle in standard position
• Coterminal angles
• Arc length and central angle measure
• Area of a sector of a circle
• Angular and linear speed

Module #3 (5.2)  (15 topics, due on 01/30/2017)

• Introduction to the Pythagorean Theorem
• Pythagorean Theorem
• Solving a rational equation that simplifies to linear: Denominator x
• Finding a solution to a linear equation in two variables
• Sketching an angle in standard position
• Coterminal angles
• Using a calculator to approximate sine, cosine, and tangent values
• Using a calculator to approximate cosecant, secant, and cotangent values
• 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
• 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 cofunction identities

Module #4 (5.3)  (14 topics, due on 02/06/2017)

• Evaluating a quadratic expression: Integers
• Square roots of perfect squares with signs
• Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
• Solving a two-step linear inequality: Problem type 1
• 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
- Sine, cosine, and tangent ratios: Variables for side lengths
- 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

**Module #5 (5.4)** (13 topics, due on 02/12/2017)

- Table for a linear function
- Evaluating functions: Linear and quadratic or cubic
- Variable expressions as inputs of functions: Problem type 1
- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
- Finding coordinates on the unit circle for special angles
- 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
- Evaluating a sinusoidal function that models a real-world situation
- Finding values of trigonometric functions given information about an angle: Problem type 3

**Module #6 (5.5)** (38 topics, due on 02/17/2017)

- Graphing an absolute value equation of the form \( y = A|x| \)
- Graphing a parabola of the form \( y = ax^2 \)
- Graphing a parabola of the form \( y = ax^2 + c \)
- Graphing a cubic function of the form \( y = ax^3 \)
- Writing an equation of a line given the y-intercept and another point
- Writing an equation and drawing its graph to model a real-world situation: Advanced
- Evaluating a cube root function
- Graphing a function of the form \( f(x) = ax + b \): Integer slope
- Graphing a function of the form \( f(x) = ax^2 \)
- Graphing a function of the form \( f(x) = ax^2 + c \)
- Graphing a parabola of the form \( y = (x-h)^2 + k \)
- Even and odd functions: Problem type 1
- Even and odd functions: Problem type 2
- Translating the graph of a parabola: One step
- Translating the graph of a parabola: Two steps
- How the leading coefficient affects the shape of a parabola
- Writing an equation for a function after a vertical translation
- Translating the graph of a function: One step
- Translating the graph of a function: Two steps
- Transforming the graph of a function by reflecting over an axis
- Transforming the graph of a function by shrinking or stretching
- Transforming the graph of a function using more than one transformation
- Transforming the graph of a quadratic, cubic, square root, or absolute value function
- Writing an equation for a function after a vertical and horizontal translation
- 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

**Module #7 (5.6)** (12 topics, due on 02/22/2017)
- Graphing a vertical or horizontal line
- Domain and range from ordered pairs
- 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 \(y = a \cos(bx)+ d\)
- Domains and ranges of trigonometric functions
- Matching graphs and equations for secant, cosecant, tangent, and cotangent functions
- Sketching the graph of a secant or cosecant function: Problem type 1
- Sketching the graph of a secant or cosecant function: Problem type 2
- Sketching the graph of a tangent or cotangent function: Problem type 1
- Sketching the graph of a tangent or cotangent function: Problem type 2

**Module #8 (5.7)** (12 topics, due on 02/27/2017)

- Set builder and interval notation
- Introduction to solving a radical equation
- Solving a radical equation that simplifies to a linear equation: One radical, basic
- Introduction to the composition of two functions
- Values of inverse trigonometric functions
- Composition of a trigonometric function with its inverse trigonometric function: Problem type 1
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 1
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 2
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 3
- Composition of trigonometric functions with variable expressions as inputs: Problem type 1
- Composition of trigonometric functions with variable expressions as inputs: Problem type 2
- Using a calculator to approximate inverse trigonometric values

**Module #9 (6.1)** (29 topics, due on 03/05/2017)

- Signed fraction addition or subtraction: Advanced
- 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 perfect square trinomial with leading coefficient 1
- Factoring a difference of squares in one variable: Basic
- Factoring a difference of squares in one variable: Advanced
- Simplifying a ratio of factored polynomials: Linear factors
- Simplifying a ratio of polynomials using GCF factoring
- Simplifying a ratio of polynomials by factoring a quadratic with leading coefficient 1
- Simplifying a ratio of polynomials: Problem type 1
- Multiplying rational expressions made up of linear expressions
- Multiplying rational expressions involving quadratics with leading coefficients of 1
- Dividing rational expressions involving linear expressions
- Dividing rational expressions involving quadratics with leading coefficients of 1
- Writing equivalent rational expressions with polynomial denominators
- Adding rational expressions with common denominators and GCF factoring
- Adding rational expressions with common denominators and quadratic factoring
- Adding rational expressions with different denominators and a single occurrence of a variable
- Adding rational expressions with denominators \(ax\) and \(bx\): Basic
- Complex fraction without variables: Problem type 2
- Complex fraction involving univariate monomials
- Complex fraction made of sums involving rational expressions: Problem type 1
- Simplifying trigonometric expressions
- Verifying a trigonometric identity
- Proving trigonometric identities: Problem type 1
- Proving trigonometric identities: Problem type 2
- Proving trigonometric identities: Problem type 3
- Proving trigonometric identities using odd and even properties

**Module #10 (6.2)** (7 topics, due on 03/13/2017)

- Evaluating a linear expression: Signed fraction multiplication with addition or subtraction
- 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
Module #11 (6.3) (10 topics, due on 03/17/2017)

- Power rules with positive exponents: Multivariate quotients
- Evaluating a rational function: Problem type 1
- Variable expressions as inputs of functions: Problem type 2
- Double-angle identities: Problem type 1
- Double-angle identities: Problem type 2
- Double-angle identities: Problem type 3
- Power-reducing identities
- Half-angle identities: Problem type 1
- Half-angle identities: Problem type 2
- Proving trigonometric identities using double-angle properties

Module #12 (6.4) (8 topics, due on 03/20/2017)

- Proving trigonometric identities using odd and even properties
- Sum and difference identities: Problem type 3
- Sum and difference identities: Problem type 4
- Double-angle identities: Problem type 2
- Double-angle identities: Problem type 3
- Product-to-sum and sum-to-product identities: Problem type 1
- Product-to-sum and sum-to-product identities: Problem type 2
- Proving trigonometric identities using sum-to-product formulas

Module #13 (6.5) (22 topics, due on 03/26/2017)

- Solving an equation written in factored form
- Finding the roots of a quadratic equation of the form \( ax^2 + bx = 0 \)
- Finding the roots of a quadratic equation with leading coefficient 1
- Finding the roots of a quadratic equation with leading coefficient greater than 1
- Solving a quadratic equation needing simplification
- Solving a radical equation that simplifies to a linear equation: One radical, advanced
- Solving a radical equation that simplifies to a quadratic equation: One radical, basic
- Solving a radical equation that simplifies to a quadratic equation: One radical, advanced
- Finding solutions in an interval for a basic equation involving sine or cosine
- Finding solutions in an interval for a basic tangent, cotangent, secant, or cosecant equation
- Solving a basic trigonometric equation using a calculator
- Solving a basic trigonometric equation involving sine or cosine
- Solving a basic trigonometric equation involving tangent, cotangent, secant, or cosecant
- 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
- Finding solutions in an interval for an equation with sine and cosine using double-angle identities
- Finding solutions in an interval for a trigonometric equation modeling a real-world situation
- Finding solutions in an interval for a trigonometric equation involving an angle multiplied by a constant
- Finding solutions in an interval for a trigonometric equation with an angle multiplied by a constant

Module #14 (6 Supp.) (8 topics, due on 03/31/2017)

- Proving trigonometric identities: Problem type 4
- Solving a trigonometric equation involving a squared function: Problem type 1
- Solving a trigonometric equation involving a squared function: Problem type 2
- Solving a trigonometric equation involving more than one function
- Finding solutions in an interval for an equation with sine and cosine using sum and difference identities
- Solving a trigonometric equation using sum and difference identities
- Solving a trigonometric equation using double-angle identities
- Solving a trigonometric equation using half-angle identities

Module #15 (7.1) (7 topics, due on 04/04/2017)

- 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

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• Expressing the area of a triangle in terms of the sine of one of its angles

Module #16 (7.2)  (5 topics, due on 04/08/2017)

• Using a trigonometric ratio to find a side length in a right triangle
• Using trigonometry to find angles of elevation or depression in a word problem
• Solving a triangle with the law of sines: Problem type 1
• Solving a triangle with the law of sines: Problem type 2
• Solving a word problem using the law of sines

Module #17 (7.3)  (7 topics, due on 04/13/2017)

• Solving a word problem using the law of sines
• Solving a triangle with the law of cosines
• Solving a word problem using the law of cosines
• Using trigonometry to find the area of a right triangle
• Finding the area of a triangle using trigonometry
• Expressing the area of a triangle in terms of the sine of one of its angles
• Heron's formula

Module #18 (7 Supp.)  (6 topics, due on 04/17/2017)

• Multiplying binomials in two variables
• Squaring a binomial: Multivariate
• Solving for a variable in terms of other variables using multiplication or division: Advanced
• Proving the law of sines
• Proving the law of cosines
• Expressing the area of a triangle in terms of the sine of one of its angles

Module #19 (8.1)  (11 topics, due on 04/23/2017)

• Solving a rational equation that simplifies to linear: Denominator x+a
• Completing the square
• Distance between two points in the plane: Exact answers
• Solving a system of linear equations using substitution
• Plotting points in polar coordinates
• Multiple representations of polar coordinates
• Converting rectangular coordinates to polar coordinates: Special angles
• Converting polar coordinates to rectangular coordinates
• Converting an equation written in rectangular form to one written in polar form
• Converting an equation written in polar form to one written in rectangular form: Problem type 1
• Converting an equation written in polar form to one written in rectangular form: Problem type 2

Module #20 (8.3 & 8.4)  (25 topics, due on 04/30/2017)

• Adding or subtracting complex numbers
• Multiplying complex numbers
• Distance between two points in the plane: Decimal answers
• Writing a position vector in ai+bj form given its graph
• Writing a vector in ai+bj form given its initial and terminal points
• Writing a vector in component form given its initial and terminal points
• Magnitude of a vector given in ai+bj form
• Magnitude of a vector given in component form
• Vector addition and scalar multiplication: ai+bj form
• Linear combination of vectors: ai+bj form
• Vector addition and scalar multiplication: Component form
• Linear combination of vectors: Component form
• Multiplication of a vector by a scalar: Geometric approach
• Vector addition: Geometric approach
• Vector subtraction: Geometric approach
• Finding the magnitude and direction of a vector given its graph
• Dot product of vectors given in ai+bj form
• Dot product of vectors given in component form
• Finding the angle between two vectors given in component form
• Classifying vector relationships by finding the angle between two vectors given in ai + bj form
• Plotting complex numbers
• Writing a complex number in standard form given its trigonometric form
• Writing a complex number in trigonometric form: Special angles
- Writing a complex number in trigonometric form: Decimal answers
- Multiplying and dividing complex numbers in trigonometric form
Grading Policy and Course Outline
MATH 1511 (Co-requisite Model using ALEKS) – Spring 2017

Instructor: Mr. Lance Williams
Course Meets: Lab Section: MW 9am-9:50am, Lecture Section: MWF 10am-10:50am
Class Location: Lincoln 404 Computer Lab
Instructor Office: Lincoln Hall, Room 408 (The M.A.C.)
Cell: Send texts via remind app
E-mail: llwilliams03@ysu.edu
Office Hours: M 11am – 12pm, T 2pm-4pm & W 2pm-4pm or by appointment

Course Title: Trigonometry
Semester: Spring 2017
Course Credit: Combined 5 s.h. (3 s.h. for lecture +2 s.h. for lab)
Term ends: Saturday May 6th

Legal Holidays: Monday January 16th (MLK Holiday)
Spring Break: Monday March 6th – Sunday March 12th

Last day to drop both courses with a grade of “W”: Thursday March 23rd

Please note: if you intend to drop this course, you will have to drop both the lecture and lab portions as this is a combined course.

Text: College Algebra & Trigonometry, Julie Miller & Donna Gerken, (1st Ed.), McGraw Hill. Do not purchase text or access codes, they are being provided at no cost to you by the publisher.

Calculator: Calculators are not permitted on unit exams, however there may be instances where you may use an on screen calculator for a limited number of problems in ALEKS or in class. (Estimating inverse trig values and certain word problems using right triangle trigonometry). Scientific calculators may be used for some questions on the final exam (subject to change). Cell phones, tablets or other electronic devices are not permitted for any and all assessments.

Cell Phone Policy: Cell phones are not to be used during class time and must be turned off. Sending text messages during class time will not be tolerated and is grounds for dismissal from the class.

Attendance: Regular attendance is necessary and expected. Attendance will be taken daily and
will be one of several factors considered in “borderline” cases of passing or failing the course. If you know ahead of time that you will have an excused absence, please let me know via email. All students are expected to participate in class.

Grading Policy:

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ALEKS Lab Journal Grade: There will be weekly lab assignments which are to be completed in your Lab Journal and turned in by the end of class every Friday. Late submissions will earn 0 credit. You are required to solve 5-10 topic questions from each weekly objective.

Quizzes: Throughout the course we will have quizzes on most lab days. The lowest 3 quiz scores will be dropped.

ALEKS Topic Objectives: This is the grade for your completed ALEKS assignments, most of which are to be completed outside of class time.

Please note:
(1) It is at the instructor’s discretion for a student to receive a passing grade in the lecture portion of the course if their final exam score is less than 60%.
(2) In order to receive a grade of “C” or better in the lab section a student must also successfully pass the lecture portion of the course with a grade of “C” or better.

Exam Schedule:
All dates are tentative and are subject to change
Exam 1: Friday February 3rd
Exam 2: Friday March 17th
Exam 3: Wednesday April 19th
Final Exam: TBA

Classroom Conduct: All students are expected to arrive and be prepared to start class on time.
Responsibilities: Primary responsibility for learning the material in this course lies with the student. Each student is responsible for attending class regularly, carefully completing daily readings, ALEKS topic objectives, coming to class on time and prepared, and actively participating in class. Any student having trouble with the material is responsible for seeking help from the instructor, tutors at the M.A.C., or from fellow peers. All assignments are expected to be completed. There is generally a strong correlation between the amount of effort expended on ALEKS and the level of success on exams. It is expected that reading, studying the text and notes, and writing out problems will require at least a three hour per day commitment (one hour in class and two hours outside of class). Any student who chooses not to fulfill the responsibilities outlined here should not expect to succeed in the course. Mathematics is learned by doing because it is inherently a “doing subject”. Simply studying the problems and examples I cover does not usually enhance the learning of mathematics. Responsible collaboration with your peers is encouraged as it will help you to assess whether you are expressing your mathematical ideas well. It is also important to work independently and turn in your own work in a timely manner.

Plagiarism/Cheating: Academic honesty is expected. Cheating on ALEKS assessments, exams, plagiarism, or any kind of unethical behavior may subject the student to severe academic penalties, including expulsion. See “The Code: A Handbook of Student Rights, Responsibilities, and Conduct” for more information. This includes plagiarism of homework exercises, your ALEKS Journal, ALEKS Pie, ALEKS Progress Checks, ALEKS Topic Objectives and all other forms of assessment in the course.

Getting help: In addition to my scheduled office hours, you may also schedule an appointment with me. The Math Assistance Center (M.A.C.) will also be open for the duration of the spring semester. We have tutors available who can guide you through ALEKS problems and help prepare you for all major exams in the course. A M.A.C. tutor(s) has been assigned to this class for the duration of the semester. If you need help raise your hand and they will assist you. Below is helpful information about the M.A.C.

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<th>Location</th>
<th>Lincoln Hall, Room 408</th>
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<td>Website</td>
<td><a href="http://web.ysu.edu/stem/mac">http://web.ysu.edu/stem/mac</a></td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:mathassist@ysu.edu">mathassist@ysu.edu</a></td>
</tr>
<tr>
<td>Telephone</td>
<td>(330)-941-3274</td>
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<tr>
<td>Spring Hours</td>
<td>Monday-Thursday 9am-6pm</td>
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<td>Friday 9am-3pm</td>
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The instructor reserves the right to change the syllabus to meet class needs or fulfill department standards and objectives. Any changes made will be announced in class, and an updated syllabus will be provided to you.
Free academic assistance is offered to help students succeed in these courses.

<table>
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<tr>
<th>Courses Required of the Major</th>
<th>Course Name</th>
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Degree Milestone course

General Education Requirements

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<th>Essential Skills</th>
<th>Art &amp; Humanities</th>
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<th>Social Science</th>
<th>Social &amp; Personal Awareness</th>
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To obtain this degree, a student will need to complete courses at the following level of difficulty:

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<td>WRITING</td>
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This should NOT serve a curriculum guide. Contact the HPES Department to receive a curriculum guide.
**College:** Bitonte College of Health & Human Services  
**Degree:** Bachelor of Science in Applied Science  
**Major:** Exercise Science

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**Degree Milestone course**

**General Education Requirements**

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<td>BIOL 1552+1552L</td>
<td></td>
<td></td>
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</table>

To obtain this degree, a student will need to complete courses at the following level of difficulty:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>MATH</td>
<td></td>
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<tr>
<td>BIOLOGY</td>
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<td>CHEMISTRY</td>
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<tr>
<td>PHYSICS</td>
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</tr>
<tr>
<td>WRITING</td>
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</table>

This should NOT serve a curriculum guide. Contact the HPES Department to receive a curriculum guide.
### Courses Required of the Major

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer 1</th>
<th>Summer 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>POL 1560 (1st semester)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>POL 2640 (2nd or 3rd semester)</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>POL 2660 (2nd or 3rd semester)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>POL 3785, POL 3786, or POL 3787</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>POL 4801</td>
<td>x</td>
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</tbody>
</table>

### Electives within the Major (18 hours)

<table>
<thead>
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<th>Course Name</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer 1</th>
<th>Summer 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>POL 1550</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>POL 3700, 3703, 3707, 3714, 3720, 3757, 3760</td>
<td>x</td>
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</tr>
<tr>
<td>POL 3701, 3702, 3717, 3718, 3722, 3741, 3751</td>
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<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POL 3724</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>POL 4810</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>POL 2695</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POL 3725</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>POL 3704, 3706, 3712, 3721, 3742, 3744, 3751, 3761, 3763, 3764, 3767, 3768, 5800, 5806, 5880</td>
<td>Varies</td>
<td></td>
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</tr>
</tbody>
</table>

### Degree Milestone course

**General Education Requirements**

<table>
<thead>
<tr>
<th>Essential Skills</th>
<th>Art &amp; Humanities</th>
<th>Natural Sciences</th>
<th>Social Science</th>
<th>Social &amp; Personal Awareness</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2623 / STAT 2625</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FOREIGN LANGUAGE THROUGH 2600</td>
</tr>
<tr>
<td>COMST 1545</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ENGL 1550</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ENGL 1551</td>
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<td></td>
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</tr>
</tbody>
</table>

To obtain this degree, a student will need to complete courses at the following level of difficulty:

<table>
<thead>
<tr>
<th>MATH/STATS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRITING</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>FOREIGN LANGUAGE</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Free academic assistance is offered to help students succeed in these courses.
Free academic assistance is offered to help students succeed in these courses.

### College of Liberal Arts & Social Sciences

#### Bachelor of Science / Arts

**Major: PSYCHOLOGY**

<table>
<thead>
<tr>
<th>Courses Required of the Major (28 hours)</th>
<th>Course Name</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer 1</th>
<th>Summer 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>PSYC 1560</strong> (1st semester)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td><strong>PSYC 2617</strong> (2nd or 3rd semester)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td><strong>PSYC 2618</strong> (2nd or 3rd semester)</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td><strong>PSYC 3700 or 3755, 3756, 3757, 3758</strong> (pick one)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td><strong>PSYC 3702 or 3775</strong></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td><strong>PSYC 3710 or PSYC 3728</strong> (4th or 5th semester)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>PSYC 3761 or PSYC 3705</strong> (4th or 5th semester)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 lab courses</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>PSYC 4890 or 4895</strong></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electives within the Major (12 hours of electives required; select from above courses or these electives)</td>
<td><strong>PSYC 2692</strong></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Electives within the Major (12 hours of electives required; select from above courses or these electives)</td>
<td><strong>PSYC 3707</strong></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Electives within the Major (12 hours of electives required; select from above courses or these electives)</td>
<td><strong>PSYC 3709</strong></td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>Electives within the Major (12 hours of electives required; select from above courses or these electives)</td>
<td><strong>PSYC 3779</strong></td>
<td>x</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Electives within the Major (12 hours of electives required; select from above courses or these electives)</td>
<td><strong>PSYC 3734</strong></td>
<td>x</td>
<td>x</td>
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</tr>
</tbody>
</table>

**Note:** Additional elective courses are offered on a rotating basis over semesters.

#### Degree Milestone course

### General Education Requirements

<table>
<thead>
<tr>
<th>Essential Skills</th>
<th>Art &amp; Humanities</th>
<th>Natural Sciences</th>
<th>Social Science</th>
<th>Social &amp; Personal Awareness</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2623 / STAT 2625</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMST 1545</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ENGL 1550</td>
<td></td>
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<tr>
<td>ENGL 1551</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Language 2600-level</td>
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</tr>
</tbody>
</table>

To obtain this degree, a student will need to complete courses at the following level of difficulty:

<table>
<thead>
<tr>
<th>MATH/STATS</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRITING</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>FOREIGN LANGUAGE</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>
College of STEM  
Bachelor of Science in Applied Science (BSAS)  
Major: INFORMATION TECHNOLOGY

### Courses Required of the Major

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer 1</th>
<th>Summer 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSIS 1525</td>
<td>x</td>
<td>x</td>
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<tr>
<td>CSIS 1590</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSIS 1595</td>
<td>X</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSIS2605 (or 2610 for 1595 + 2605)</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSIS 2699 or CSIS 4893</td>
<td>x</td>
<td>X</td>
<td>x</td>
<td>x</td>
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<tr>
<td>CSIS 2620</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or CSIS 3782</td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>CSIS 3722</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>CSIS 3723 or 3783</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>CSIS 3726</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>CSIS 3755</td>
<td>X</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 2663</td>
<td>x</td>
<td>x</td>
<td></td>
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<tr>
<td>INFO 3704</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 3743 or ENGL 3774</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>INFO 3774</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 3775</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO 4880</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAT 2601</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>MATH 1552</td>
<td>x</td>
<td>x</td>
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</table>

### Electives within the Major  
(15 SEMESTER HOURS UPPER DIVISION)

### Degree Milestone Course General Education Requirements

<table>
<thead>
<tr>
<th>Essential Skills</th>
<th>Art &amp; Humanities</th>
<th>Natural Sciences</th>
<th>Social Science</th>
<th>Social &amp; Personal Awareness</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>MATH 1552</td>
<td>2</td>
<td>2, (1 LAB)</td>
<td>2</td>
<td>2</td>
<td>1</td>
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<td>CMST 1545</td>
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<td>ENGL 1551</td>
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</table>

### To obtain this degree, a student will need to complete courses at the following level of difficulty:

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<th>4</th>
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<td>MATH/STATS</td>
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<tr>
<td>DATABASE MANAGEMENT</td>
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<tr>
<td>COMPUTER PROGRAMMING</td>
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</tr>
<tr>
<td>VERBAL/WRITTEN/TECH</td>
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<tr>
<td>OPERATING SYSTEMS</td>
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<td>MULTI MEDIA</td>
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<tr>
<td>COMPUTER NETWORKING</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>Courses Required of the Major</th>
<th>Course Name</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer 1</th>
<th>Summer 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSIS 2610 or (1595 + 2605)</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>CSIS 3700</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSIS 3701</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
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<td>CSCI 3710</td>
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<td>CSCI 5806</td>
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<td>CSCI 5801</td>
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<tr>
<td></td>
<td>OR 5814</td>
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<tr>
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<td>CSCI 5870</td>
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</tr>
<tr>
<td></td>
<td>ENGL 3743</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td></td>
<td>MATH 1571 (minor/major/GER)</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>MATH 1572 (minor/major)</td>
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<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>MATH 3720 (minor/major)</td>
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<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STAT 3743 (minor/major)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Electives within the Major (12 semester hours)</td>
<td>OR MATH 3760</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Degree Milestone Course

General Education Requirements

<table>
<thead>
<tr>
<th>Essential Skills</th>
<th>Art &amp; Humanities</th>
<th>Natural Sciences</th>
<th>Social Science</th>
<th>Social &amp; Personal Awareness</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 1571</td>
<td>Phil 2625 &amp; 1 other</td>
<td>2 (1 course w/ lab)</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>COMST 1545</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ENGL 1550</td>
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<td></td>
</tr>
<tr>
<td>ENGL 1551</td>
<td></td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<th>4</th>
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</thead>
<tbody>
<tr>
<td>MATH/STATS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROBLEM SOLVING IN DATABASES, NETWORKING, SECURITY</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>COMPUTER PROGRAMMING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal/Written/Technical Communication</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>SOFTWARE DESIGN/DEVELOPMENT</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Corequisite course offerings
Purpose: Get students into college credit courses from their first semester

MATH 1510
MATH 2623
MATH 2625
And
ENGL 1550

Corequisite Lab

College Credit Courses
Mathematics and Statistics

Fall 2017 Corequisite course offerings –

• tagged ----C

• MATH 2623C, 2-3 sect., placement from MATH 1501 or any higher remedial math level

• MATH 2625C, 1 section, placement from MATH 1501 or any higher remedial math level

• MATH 1510C, 2 sections, placement from MATH 1507
English and Writing

Fall 2017 Corequisite Offerings

• tagged ----C

• ENGL 1539, 3 credit hrs. then 1550C

• ENGL 1550C, 6 sects, 4 credit hrs., placement from ACT sub score 15-17
Barometer of Milestone Courses

Example of difficulty barometer to be included as a program snapshot for a degree program.

This will help students to make an informed choice.

<table>
<thead>
<tr>
<th>MATH/STATS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Biology</td>
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<tr>
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<tr>
<td>Writing</td>
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</tbody>
</table>
Students find the snapshots simpler and less overwhelming than the multi-page curriculum sheets for the degree programs.
Campus wide implementation ...

- Staged implementation
- Feedback for Us
- Questions