**MAC 1140 Course Calendar Summer B 2020**

\*Calendar is subject to change

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| **Date** | **Topic** | **Objectives** | **OpenStax Section** |
| **7/6** | **Real Numbers** | * Represent and classify real numbers.
* Order real numbers and use inequalities.
* Find the absolute values of real numbers and find the distance between two real numbers.
* Evaluate algebraic expressions.
* Use the basic rules of properties of algebra.
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| **7/7** | **Exponentials****And Radicals** | * Use properties of exponents
* Use scientific notation to present real numbers
* Use properties of radicals
* Simplify and combine radical expressions
* Rationalize denominators and numerators
* Use properties of rational exponents
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| **7/8**  | **Polynomials and factoring** | * Write polynomials in standard form
* Add, subtract, multiply polynomials
* Use special products to multiply polynomials
* Factor out common actors from polynomials
* Factor special polynomial forms
* Factor trinomials as the product of two binomials

Factor polynomials by grouping |  |
| **7/9** | **Rational expressions** | * Find domains of algebraic expressions
* Simplify rational expressions
* Add, subtract, multiply, and divide rational expressions
* Simplify complex
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| **7/10** | **Solving equations** | * Rewrite difference quotients
* Identify distinct types of equations
* Solve linear equations in one variable and rational equations that lead to linear equations
* Solve quadratic equations by factoring, extracting square roots, completing the square, and using the quadratic formula.
* Solve polynomial equations of degree three or greater
* Solve radical equations
* Solve absolute value equations
* Use common formulas to solve real-life problems.

Quiz 1 is due today! |  |
| **7/13** | **Linear inequalities**  | * completing the square
* Represent solutions of linear inequalities in one variable.
* Use properties of inequalities to write equivalent inequalities
* Solve linear inequalities in one variable.
* Solve absolute value inequalities
* Use linear inequalities to model and solve real-life problems
* Exam 1 review
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| **7/14(END OF EXAM 1 MATERIAL)** | **Algebraic Errors** | * Avoid common algebraic errors
* Recognize and use algebraic techniques that are common in calculus.
* Exam 1 review if time permits
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| **7/15** | **Exam 1 Review** |  All concepts covered so far. |  |
| **7/16** | **Rectangular coordinates.** | * Plot points in the cartesian plane.
* Use the distance formula to find the distance between two points.
* Use the midpoint formula to find the midpoint of a line segment.
* Use a coordinate plane to model and solve real-life problems
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| **7/17** | **Graphs** | * Sketch graphs of equations
* Find x- and y-intercepts of graphs of equations
* Use symmetry to sketch graphs of equations
* Write equations of circles

Quiz 2 is due today! |  |
| **7/20** | **Linear equations**  | * Write equations of circles.
* Use slope to graph linear equations in two variables. Find the slope of a line given two points on the line.
* Write linear equations in two variables.
* Use slope to identify parallel and perpendicular lines.
* Use slope and linear equations to two variables to model and solve real-life problems.
 | **2.1** |
| **7/21** | **Functions** | * Determine whether relations between two variables are functions and use function notation
* Find the domains of functions.
* Use functions to model and solve real-life problems
* Evaluate difference quotient.
 | **1.1** |
| **7/22** | **Analyzing graphs of functions** | * Use the Vertical Line Test for functions.
* Find the zeros of functions.
* Determine intervals on which functions are increasing or decreasing.
* Determine relative minimum and relative maximum values of functions.
* Determine the average rate of change of a function.
* Identify even and odd functions.
 | **1.3** |
| **7/23** | **A library of functions and transformations of functions** | * Identify and graph linear and squaring functions.
* Identify and graph cubic, square root, and reciprocal functions.
* Identify and graph step and other piece-wise-defined functions.
* Recognize graphs of parent functions.
* Use vertical line and horizontal shifts to sketch graphs of functions.
* Use reflections to sketch graphs of functions.
* Use nonrigid transformations to sketch graphs of functions.
 | **1.5** |
| **7/24** | **Combinations of functions** | * Add, subtract, multiply, and divide functions.
* Find the compositions of one function with another function.
* Use combinations and compositions of functions to model and solve real-life problems

Quiz 3 is due today! | **1.4** |
| **7/27** | **Inverse functions** | * Find inverse functions informally and verify that two functions are inverse functions of each other.
* Use graphs to verify that two functions are inverse functions of each other.
* Use the horizontal line test to determine whether functions are one-to-one.
* Find inverse functions algebraically.
 | **1.7** |
| **7/28** | **Quadratic functions** | * Analyze graphs of functions.
* Write quadratic functions in standard form and use the results to sketch their graphs.
* Find minimum and maximum values of quadratic functions in real-life applications.
 | **3.2** |
| **7/29** | **Exam 2 Review** | All concepts introduced after exam 1. |  |
| **7/30** | **Polynomial functions of higher degree and division of polynomials** | * Use transformations to sketch graphs of polynomial functions
* Use the leading coefficient test to determine the end behaviors of graphs of polynomial functions.
* Find real zeros of polynomial functions and use them as sketching aids.
* Use the Intermediate Value Theorem to help locate real zeros of polynomial functions.
* Use long division to divide polynomials by other polynomials
* Use synthetic division to divide polynomials by binomials of the form (x-k)
* Use the remainder Theorem and the Factor Theorem.
 | **3.4, 3.5** |
| **7/31** | **Complex numbers** | * Use the imaginary unit I to write complex numbers.
* Add, subtract, and multiply complex numbers.
* Use complex conjugates to write the quotient of two complex numbers in standard form.
* Find complex solutions of quadratic equations.

Quiz 4 is due today! | **3.1** |
| **8/3** | **zeros of polynomial functions** | * Use the Fundamental Theorem of Algebra to determine number of zeros of polynomial functions.
* Fid rational zeros of polynomial functions.
* Find complex zeros using conjugate pairs.
* Find zeros of polynomials by factoring.
* Use Descartes’s Rule of Signs and the Upper and Lower Bound Rules to find zeros of polynomials in real-life applications.
 | **3.6** |
| **8/4** | **Rational functions** | * Find domains of rational functions.
* Find vertical and horizontal asymptotes of graphs of rational functions.
* Sketch graphs of rational functions.
* Sketch graphs of rational functions that have slant asymptotes.
* Use rational functions to model and solve real-life problems.
 | **3.7** |
| **8/5** | **Nonlinear inequalities** | * Solve polynomial inequalities
* Solve rational inequalities
* Use nonlinear inequalities to model and solve real-life problems.
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| **8/6** | **Linear and nonlinear systems of equations** | * Use the method of substitution to solve systems of linear equations in two variables.
* Use the method of substitution to solve systems of nonlinear equations in two variables.
* Use a graphical method to solve systems of equations in two variables.
* Use systems of equations to model and solve real-life problems.
 | **9.1, 9.3** |
| **8/7** | **Exponential functions** | * Recognize and evaluate exponential functions with base a.
* Graph exponential functions and use the One-to-One property.
* Recognize, evaluate, and graph exponential functions with base e.
* Use exponential functions to model and solve real-life problems.

Quiz 5 is due today! | **4.1, 4,2** |
| **8/10** | **Logarithmic functions** | * Recognize and evaluate functions with base a.
* Graph logarithmic functions.
* Recognize, evaluate, and graph natural logarithmic functions.
* Use logarithmic functions to model and solve real-life problems.
 | **4.3** |
| **8/11** | **Properties of logarithms and Exponential and logarithmic equations** | * Use the change-of base formula to rewrite and evaluate logarithmic expressions.
* Use properties of logarithms to evaluate or rewrite logarithmic expressions. Use properties of logarithms to expand or condense logarithmic expressions.
* Use logarithmic functions to model and solve real-life problems.
* Solve simple exponential and logarithmic equations.
* Solve more complicated exponential equations.
* Solve more complicated logarithmic equations.
* Use exponential and logarithmic equations to model and solve real-life problems.
 | **4.5** |
| **Alternatively, 8/11** | **Exam three review** | All Concepts introduced after Exam two |  |
| **8/12** | **Exponential and logarithmic models** | * Recognize the five most common types of models involving exponential and logarithmic functions.
* Use exponential growth and decay functions to model and solve real-life problems
* Use Gaussian functions to model and solve real-life problems.
* Use logistic growth functions to model and solve real-life problems.
* Use logarithmic functions to model and solve real-life problems.
 | **4.6** |
| **8/13 (Last day)** | **Final exam Review Day** | * Final exam review
 | **4.7** |
| **8/14** | **No class** |  |  |