**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. |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **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. |  |
| **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** |  |  |