

Math 2 – Instructional Objectives and Student Learning Outcomes

The goals of this course are to provide students with a better understanding of and preparation for mathematics prior to enrolling in a calculus course.

Learning Objectives Students enrolled in this course will:	Student Learning Outcomes Students that successfully complete this course will be able to:
1. Learn about functions and their graphs.	a. Determine whether a relation represents a function. b. Find the value of a function. c. Find the domain and range of a function. d. Form the sum, difference, product, quotient and composite of two functions. e. Identify the graph of a function. f. Sketch the graph of basic functions. g. Sketch the graph of functions obtained by transformations of basic functions. h. Determine if a function is even or odd both from the graph and the equation. i. Use a graph to determine where a function is increasing or decreasing. j. Use a graph to locate local maximum and minimum values of a function. k. Compute the average rate of change of a function. l. Determine if a function is one-to-one. m. Find the inverse of a one-to-one function, determine its domain and range and sketch its graph.
2. Learn the properties of linear and quadratic functions	a. Obtain the different forms of the equation of a linear function. b. Identify from any form of the equation of a line its slope and intercepts. c. Solve application problems involving linear functions. d. Find the zeros of a quadratic function by factoring, by completing the square and by using the quadratic formula. e. Find the vertex, axis of symmetry and sketch the graph of a quadratic function. f. Find the maximum or minimum value of a quadratic function. g. Solve equations that are quadratic in form. h. Solve inequalities involving linear and quadratic functions. i. Solve application problems involving quadratic functions or functions that are quadratic in form.
3. Learn the properties of polynomial and rational functions.	a. Identify polynomial and rational functions. b. Perform algebraic operations with polynomial and rational functions. c. Find the real zeros of a polynomial and rational functions. d. Sketch the graph of polynomial functions. e. Find the domain and all asymptotes of a rational function.

	<ul style="list-style-type: none"> f. Sketch the graph of rational functions identifying asymptotes and intercepts. g. Solve application problems involving polynomial and rational functions.
4. Learn the properties of exponential and logarithmic functions.	<ul style="list-style-type: none"> a. Evaluate exponential and logarithmic functions. b. Work with the properties of exponents and logarithms. c. Sketch the graph of logarithmic and exponential functions. d. Define the number e. e. Change exponential expressions to logarithmic expressions and logarithmic expressions to exponential expressions. f. Solve exponential and logarithmic equations. g. Solve application problems involving exponential and logarithmic functions.
5. Learn about angles and their measure.	<ul style="list-style-type: none"> a. Convert between degrees, minutes and seconds and decimal forms for angles. b. Find the arc length of a sector of a circle. c. Find the area of a sector. d. Convert between degrees and radians. e. Find the linear and angular speed of an object moving in circular motion.
6. Learn the trigonometric functions and their properties.	<ul style="list-style-type: none"> a. Define the trigonometric functions using the sides of a right triangle. b. Define the trigonometric functions using the unit circle. c. Find the values of the trigonometric functions of acute angles. d. Find the values of the trigonometric functions of an angle using a point on the unit circle. e. Find the value of the trigonometric functions of an angle given the value of one function and the quadrant of the angle. f. Use the properties of trigonometric function to find their values. g. Use a calculator to find the values of the trigonometric functions. h. Graph of the trigonometric functions over one and several periods. i. Graph transformations of the trigonometric functions.
7. Learn the inverse trigonometric functions and their properties.	<ul style="list-style-type: none"> a. Define the inverse trigonometric functions. b. Find the exact value of the inverse trigonometric functions. c. Use a calculator to find the values of the inverse trigonometric functions. d. Find the value of expressions involving the inverse trigonometric functions.
8. Learn analytic trigonometry.	<ul style="list-style-type: none"> a. Learn to use algebraic techniques to simplify trigonometric expressions and establish trigonometric identities. b. Use the sum and difference identities to find exact values and to establish identities. c. Use the double-angle and half-angle formulas to find exact values and establish identities.

	d. Solve equations involving trigonometric functions.
9. Learn to use trigonometric functions to solve applications.	<ul style="list-style-type: none"> a. Solve right triangles. b. Solve applied problems requiring the use of right triangles. c. Solve triangles using the Law of Sines. d. Solve triangles using the Law of Cosines. e. Solve applied problems requiring the use of the Law of Sines of the Law of Cosines. f. Find the area of a triangle.
10. Learn to work with polar coordinates.	<ul style="list-style-type: none"> a. Plot points using polar coordinates. b. Convert from polar coordinates to rectangular coordinates. c. Convert from rectangular coordinates to polar coordinates. d. Graph polar equations by plotting points.
11. Learn to solve systems of equations and inequalities.	<ul style="list-style-type: none"> a. Solve systems of linear equations in two or three variables using substitution and elimination. b. Solve systems of nonlinear equations in two variables using substitution and elimination.
12. Learn analytic geometry.	<ul style="list-style-type: none"> a. Find the midpoint of a segment. b. Find the distance between two points. c. Find the distance between a point and a line. d. Recognize, classify and graph parabolas identifying all relevant parts. e. Recognize, classify and graph ellipses identifying all relevant parts. f. Recognize, classify and graph hyperbolas identifying all relevant parts.
13. Learn to find all roots of polynomial equations.	<p>Find real roots of polynomial equations using</p> <ul style="list-style-type: none"> a. Fundamental Theorem of Algebra b. Factor and Remainder Theorems c. Location Theorem d. Conjugate Root Theorem.