

MAT 116: Pre-Calculus

Course Description: Behavior of functions in some depth including properties, graphs, inverses, transformations, and compositions. This course pays particular attention to linear, quadratic, polynomial, rational, exponential, and logarithmic functions. It covers trigonometric functions and inverse trigonometric functions as well.

Credit hours: 3

Pre-requisites: High School Mathematics

Contents:

1. Rectangular Coordinates, Distance formula, Midpoint Formulas, Triangles and quadrilateral related problems, Graphs by Plotting Points and Finding Intercepts, Test for Symmetry
2. Slopes, Graph of a line using a point and slope, Different form of equations, Find Equations of Horizontal, Vertical, Parallel and Perpendicular Lines
3. Equations of circles, Graphing a circles
4. Functions and Graphs, Identifying graphs of functions, Vertical and Horizontal line tests
5. Properties of functions: Even, odd and constant, increasing, decreasing functions, Secant line
6. Library of functions, Piecewise-defined functions
7. Graphing Techniques, Transformations, Compressions and Stretches
8. Linear functions and their properties, Linear models
9. Quadratic functions, Graphs of quadratic functions using its properties and graphing techniques
10. Quadratic models, Maximizing revenue and enclosed area, Motion of projectile
11. Polynomial and power functions, Graphs using transformation, Properties of graphs
12. Properties and graph of rational functions, Horizontal and vertical Asymptotes
13. Solution of quadratic inequalities and their graphs, Polynomial and Rational Inequalities
14. Real and complex zeros of a polynomial function, Fundamental Theorem of Algebra
15. Composite functions, Inverse functions, One-to-One function
16. Exponential functions, Graphs and properties of exponential functions, Solutions of exponential equations, Applications of exponential functions
17. Logarithmic functions, Relating logarithms to exponential, Domain, Graphs, Solutions of Logarithmic equations
18. Angles and their measure, Linear speed, Trigonometric functions: Unit circle approach
19. Properties and graph of Trigonometric functions, Amplitude, Period and Phase shift
20. The inverse of trigonometric functions