

## **Pre-Calculus Course Outline**

### **Chapter 1: Linear Relations and Functions**

**Topics included in this chapter are Compositions and Inverses of functions, linear functions and inequalities, distance and slope, forms of linear equations, parallel and perpendicular lines.**

### **Chapter 2 : Systems of Equations and Inequalities**

**Topics included in this chapter are: Solving systems of equations, matrices, determinants and multiplicative inverses of matrices, solving systems of inequalities, Linear Programming.**

### **Chapter 3: The Nature of Graphs**

**Topics included in this chapter are: Symmetry of graphs, families of graphs, graphs of inverses, rational functions and asymptotes, tangents to a curve, locating critical points of a graph.**

### **Chapter 4: Polynomial and Rational Functions**

**Topics included in this chapter are: Remainder and Factor theorems, Rational Root theorem, locating zeros of a function, partial fractions.**

### **Chapter 5: The Trigonometric Functions:**

**Topics included in this chapter are: Degree and Radian measure, central angles and arcs, Trigonometric functions of special angles, right triangle problems, Law of Sines, Law of Cosines, and Area of a triangle.**

### **Chapter 6: Graphs and Inverses of the Trigonometric Functions:**

**Topics in this chapter are: Amplitude, period, frequency, phase shift, graphing trig functions, graphing inverse trigonometric functions, Principal values of trig functions, simple harmonic motion.**

### **Chapter 7: Trigonometric Identities and Equations:**

**Topics in this chapter are: Pythagorean Identities, Sum and Difference Identities, Double- Angle and Half- Angle identities, Verifying trig identities, solving trigonometric equations, Normal form of a Linear equation, distance from a point to a line.**

### **Chapter 8: Polar Coordinates and Complex Numbers:**

**Topics in this chapter are: Graphing polar equations, polar vs. rectangular coordinates, polar form of a linear equation, simplifying complex numbers, polar form of complex numbers, powers and roots of complex numbers.**

**Chapter 9: Conics:**

**Topics included in this chapter are: circles, parabolas, ellipses, hyperbola, conic sections.**

**Chapter 10: Exponential and Logarithmic Functions:**

**Topics in this chapter are: Rational exponents, exponential functions, the number  $e$ , compound interest, logarithmic functions, common logarithms, natural logarithms.**