Math 1120: College Trigonometry (Topical List)
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Course Description: Topics in trigonometry, analytic geometry, and elementary functions designed for students who intend to take the calculus sequence. Angles and trigonometry functions of acute angles, analytic trigonometry, fundamental trigonometric functions and identities including hyperbolic trigonometry, parametric equations, and polar coordinate system. Graphic calculators and/or computer algebra systems are used extensively. Applications are emphasized.
Colorado state-wide Guaranteed Transfer course.

Prereq: MATH 1110 and placement test.
No joint credit with MATH 1130.

Core Topics (Mandatory)
* Angles and Their Measure
*Converting between degrees and radians and vice versa
*Arc Length
*Area of a Sector
*Find the Values of Trigonometric Functions of Acute Angles
*Use the Fundamental Trig Identities
*Find the Values of the Remaining Trig Functions given the value of one of them
*Use the Complementary Angle Theorem
*Use a Calculator to Approximate the Value of Trigonometric Functions
*Model and Solve Applied Problems Involving Right Triangles
*Find the Exact Values of the Trigonometric Functions for General Angles
*Use Coterminal Angles to Find the Exact Value of a Trigonometric Function
*Determine the SIGN of the Trigonometric Functions of an Angle in a given Quadrant
*Find the Reference Angle of a General Angle
*Use the Unit Circle to find the exact values of trigonometric functions.
*Know the Domain and Range of the Trigonometric Functions
*Use Even-Odd Properties to find the exact values of the trigonometric functions
*Graph sine and cosine functions using transformations
*Find an equation of a given Sinusoidal Graph
*Determine the Amplitude and Period of Sinusoidal Functions
*Graph tangent, cotangent, secant, and cosecant functions
*Build Sinusoidal Models from Data
*Graph sinusoidal functions of the form $y = a\sin(bx - c) + d$
*Find the exact value of Inverse Sine, Cosine or Tangent Functions
*Use Properties of Inverse Functions to Find Exact Values of Certain Composite Functions
*Solve Equations Involving Inverse Trigonometric Functions
*Find the Inverse Function of a Trigonometric Function
*Know the domain and range of the Inverse Trigonometric Functions

*Find Exact Values of Expressions Involving the Inverse Sine, Cosine, and Tangent Functions
*Use Algebra to Simplify Trigonometric Expressions
*Establish Trigonometric Identities
*Use Sum and Difference Formulas to Find Exact Values and Establish Identities
*Use Double and Half-Angle Formulas to Find Exact Values and Establish Identities
*Solve Equations of a single Trigonometric Function
*Solve Right Triangles
*Solve Applied Problems
*Solve SAA or ASA Triangles
*Solve SSA Triangles
*Solve SAS and SSS Triangles
*Find the Area of SAS and SSS Triangles
*Plot Points Using Polar Coordinates
*Transform Equations from Polar to Rectangular Form and Vice Versa
*Graph and Identify Polar Equations by Converting to Rectangular Equations
*Graph Polar Equations Using a Graphing Utility
*Plot points in the Complex Plane
*Convert a Complex Number from Rectangular to Polar Form
*Use De Moivre's Theorem
*Graph Parametric Equations by Hand
*Graph Parametric Equations Using a Graphing Utility
*Convert from rectangular equations to parametric form and vice versa
*Write the Terms of a Sequence Defined by a Recursive Formula
*Use Summation Notation
*Find the Sum of a Sequence Algebraically

Optional Topics
*Express Products as sums and Sums and Products
*Solve Trigonometric Equations Linear in Form.
*Solve Trigonometric Equations Quadratic in Form.
*Solve Trigonometric Equations using a Graphing Utility
*Simple Harmonic Motion
*Graph Vectors
*Find a Position Vector
*Add and Subtract Vectors
*Find a Scalar Multiple and the Magnitude of a Vector
*Find the Dot Product of Two Vectors
*Find the Angle Between Two Vectors
*Know the Names of Conics
*Arithmetic Sequences
*Geometric Sequences; Geometric Series

Technology Exposure
Use of the TI 83/84 graphing calculator. Calculators will be utilized both in class and on 4 Trigonometry Application Problems. They will also optionally be utilized on a small portion of each exam.