MATH 126
Analytic Trigonometry
<u>Course Objectives</u>

Unit 1: Inverses
1.1 Review Trigonometric Functions
1.1.1   Determine values of trigonometric functions for special angles.
1.1.2   Determine values of trigonometric functions for angles.
1.2 Graph inverse trigonometric functions
1.2.1   Determine the domain and range, and graph for $y = \sin^{-1}(x)$.

1.2.2   Determine the domain and range, and graph for $y = \cos^{-1}(x)$ and $y = \tan^{-1}(x)$.

1.3 Determine angles from trigonometric values
1.3.1   Determine values for inverse functions.
1.3.2   Determine solutions to equations.
1.4 Use composition to find values
1.4.1   Use composition to find exact values.
1.4.2   Use composition to explore inverses.
1.5 Solve applications
1.5.1   Solve angle of elevation problems.
1.5.2   Solve other applications.

Unit 2: Fundamental Identities
2.1 Develop and apply basic identities
2.1.1   Verify identities.
2.1.2   Determine the domain of validity for trigonometric identities
2.2 Develop and apply cofunction and odd-even identities
2.2.1   Determine cofunction identities.
2.2.2   Determine odd-even identities.
2.3 Develop and apply Pythagorean identities
2.3.1   Develop the Pythagorean identities.
2.3.2   Apply the Pythagorean identities.
2.4 Verify identities
2.4.1   Prove elementary identities.
2.4.2   Prove identities.
2.5 Solve equations
2.5.1   Solve trigonometric equations.
2.5.2   Use Pythagorean identities to solve equations.

Unit 3: Sum and Difference Identities
3.1 Develop and apply the cosine sum identity
3.1.1   Derive identities from the cosine sum identity.
3.1.2   Find exact values with the cosine sum identity.
3.2 Develop and apply the cosine difference identity
3.2.1   Derive identities from cosine difference identity.
3.2.2   Find exact values with the cosine of a difference identity.
3.3 Develop and apply the sine of a sum identity
3.3.1   Derive identities from the sine sum identity.
3.3.2   Find exact values with the sine sum identity.
3.4 Develop and apply the sine of a difference identity
3.4.1   Derive identities with the sine difference identity.
3.4.2   Find exact values with the sine difference identity.
3.5 Develop and apply the tangent of sums and differences
3.5.1   Derive identities from the tangent sum and difference identities.
3.5.2   Find exact values with the tangent sum and difference identities.

Unit 4: Identities and Equations
4.1 Derive and apply the double angle identity for sine
4.1.1   Derive identities using the double angle identity for sine.
4.1.2   Solve problems with the double angle identity for sine.
4.2 Derive and apply the double angle identity for cosine and tangent
4.2.1   Derive the double angle identity for cosine and tangent.
4.2.2   Solve problems with the double angle identity for cosine and tangent.
4.3 Derive and apply the half angles identities
4.3.1   Derive the half angles formulas.
4.3.2   Solve problems using half angle identities.
4.4 Solve equations
4.4.1   Solve equations using the double angles.
4.4.2   Solve equations using half angles.
4.5 Solve equations using identities
4.5.1   Solve equations I.
4.5.2   Solve equations II.