Virginia Community College Course Content Summary

Course Title: __MTH 162: PreCalculus II__

Course Description
Presents trigonometry, trigonometric applications including Law of Sines and Cosines and an introduction to conics. Lecture 3 hours per week. 3 credits.

General Course Purpose
The general purpose of this one-semester course, in conjunction with Precalculus I, is to prepare students for the skills and level of rigor needed for successful study in a sequence of courses in calculus with analytic geometry.

Course Prerequisites/Corequisites
Prerequisite: Completion of MTH 161 or equivalent with a grade of C or better.

Course Objectives

Upon completing the course, the student will be able to:

Trigonometric Functions
- Identify angles in standard form in both degree and radian format and convert from one to the other.
- Find the arc length.
- Find the value of trigonometric functions of common angles without a calculator using the unit circle and right triangle trigonometry.
- Use reference angles to evaluate trig functions.
- Find the value of trigonometric functions of angles using a calculator.
- Use fundamental trigonometric identities to simplify trigonometric expressions.
- Graph the six trigonometric functions using the amplitude, period, phase and vertical shifts.
- Use trig functions to model applications in the life and natural sciences.

Analytic Trigonometry
- Use the fundamental, quotient, Pythagorean, co-function, and even/odd identities to verify trigonometric identities.
- Use the sum and difference, double angle, half-angle formulas to evaluate the exact values of trigonometric expressions.
- Determine exact values of expressions, including composite expressions, involving inverse trigonometric functions.
- Solve trigonometric equations over restricted and non-restricted domains.

Applications of Trigonometry
- Solve right triangles and applications involving right triangles.
- Use the Law of Sines and Cosines to solve oblique triangles and applications.

Conics
$$Ax^2 + By^2 + Dx + Ey + F = 0$$
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- Write the equations of circles, parabolas, ellipses, and hyperbolas in standard form centered both at the origin and not at the origin.
- Identify essential characteristics unique to each conic.
- Graph equations in conic sections, centered both at the origin and not at the origin.
- Solve applications involving conic sections.

Sequences and Series (Optional unit at the discretion of the department.)
- Identify the terms of geometric sequences.
- Find a particular term of geometric sequence.
- Determine the formula for the a_n term of geometric sequences.
- Find the sum of first n terms of finite geometric series.

- Find the sum of infinite geometric series.
- Introduce arithmetic concepts as time allows.

Major Topics to be Included
Trigonometric Functions
Analytic Trigonometry
Applications of Trigonometry
Conics