New 8/2018

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
MTH 162 – PRECALCULUS II (3 CR.)

Course Description

Presents trigonometry, trigonometric applications including Law of Sines and Cosines and an introduction to conics. Credit will not be awarded for both MTH 162 and MTH 167 or equivalent. Lecture 3 hours. Total 3 hours per week.

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(s): Placement or completion of MTH 161: Precalculus I or equivalent with a grade of C or better.

Course Objectives

- 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.
  - Apply concepts of trigonometry to extended topics such as plotting polar coordinates, converting rectangular and polar coordinates from one to the other, identifying vector magnitude and direction, or performing operations with vectors such as addition, scalar multiplication, component form, and dot product.
- Conics
  - Identify the conic sections of the form:Ax^2+By^2+Dx+Ey+F=0.
  - 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, not required for transfer.)

- Identify the terms of geometric sequences.
- Find a particular term of geometric sequence.
- Determine the formula for the an 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

a) Trigonometric Functions
b) Analytic Trigonometry
c) Applications of Trigonometry
d) Conics