

NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY
MTH 164 – PRECALCULUS II (3 CR.)

COURSE DESCRIPTION

Presents trigonometry, analytic geometry, and sequences and series. (Credit cannot be awarded for both MTH 164 and MTH 166.) Lecture 3 hours per week.

GENERAL COURSE PURPOSE

The general purpose of this one-semester course is to prepare students for a course in a calculus and analytic geometry sequence by providing them with the necessary competence in trigonometry, analytic geometry, and sequences and series, as well as competency in the use of a graphing utility. At NVCC, MTH 164 is used in conjunction with MTH 163 to prepare the student for MTH 173-174 – Calculus and Analytic Geometry I – II.

ENTRY LEVEL COMPETENCIES

Prerequisite: MTH 163 – Precalculus I

COURSE OBJECTIVES

As a result of the learning experience in this course, the student should be able to:

- A. Evaluate trigonometric and inverse trigonometric functions
- B. Use trigonometric formulas to prove trigonometric identities, solve triangles, and trig equations
- C. Graph conic sections
- D. Create sequences and series (including arithmetic and geometric)
- E. Use a graphing utility as an aid in problem solving

MAJOR TOPICS TO BE INCLUDED

- A. Trigonometric Functions
 - 1. Distance between two points in a plane
 - 2. Midpoint of a line segment
 - 3. Unit circle
 - 4. Circular functions
 - a. Definitions
 - b. Simple properties (Pythagorean, Reciprocal, Complementary)
 - 5. Formulas for $f(x \pm y)$, $f(2x)$, $f(x/2)$
 - 6. Graphs of trigonometric functions
 - 7. Inverses of trigonometric functions
 - 8. Proving trigonometric identities
 - 9. Solution of trigonometric equations
 - 10. DeMoivre's Theorem
- B. Applications of Trigonometric Functions to Triangles
 - 1. Trigonometric functions for right triangles
 - 2. Solutions of right triangles
 - 3. Law of Sines
 - 4. Law of Cosines

C. Conic Sections of the form: $Ax^2 + By^2 + Cx + Dy + E = 0$

1. Parabolas

- a. Finding vertex by completing the square
- b. Graphing

2. Circles

- a. Finding center and radius by completing the square
- b. Graphing

3. Ellipses

- a. Find axes and center
- b. Graphing

4. Hyperbolas

- a. Axes and asymptotes
- b. Graphing

D. Sequences and Series

- 1. Definitions
- 2. Arithmetic Sequences and Series
- 3. Geometric Sequences and Series

EXTRA TOPICS (optional)

- A. Mathematical Induction
- B. Binomial Theorem