

**NVCC COLLEGE-WIDE COURSE CONTENT SUMMARY  
MTH 116 - TECHNICAL MATHEMATICS II (3 CR.)**

**Course Description**

Presents algebra through exponential and logarithmic functions, trigonometry, vectors, analytic geometry, complex numbers, systems of linear equations, and quadratic equations. Lecture 3 hours per week.

**General Course Purpose**

To develop an understanding of the concepts of algebra trigonometry and logarithms and their use in, and application to, solution of technical problems.

**Entry Level Competencies**

Prerequisites are a satisfactory score on an appropriate proficiency exam for MTH 155 and Algebra I and Geometry or Algebra I and Algebra II or equivalent.

**Course Objectives**

The objective of these two courses is to provide the necessary background in mathematics for further studies in engineering technology.

**Major Topics To Be Included**

- A. Logarithmic Functions & Exponential Functions using the scientific calculator:
  - 1. Common logs
  - 2. Natural logs
  - 3. Applications of both common and natural logs
  - 4. Solving logarithmic equations.
  
- B. Trigonometric Functions using the scientific calculator
  - 1. Review of Right Triangle Trigonometry
  - 2. Oblique Triangle Trigonometry
    - a. Law of Sines
    - b. Law of Cosines
    - c. Applications of Law of Sines and Cosines
  - 3. Circular Functions
  - 4. Graphs of  $\sin x$ ,  $\cos x$ , and  $\tan x$ 
    - a. amplitude
    - b. period and frequency
    - c. phase shift
    - d. displacement
  
- C. Vectors in 2 and 3 Space
  - 1. Addition
  - 2. Representations
  - 3. Dot and Cross Product
  - 4. Application in solving problems using vectors
  
- D. Complex Numbers
  - 1. Arithmetic Computations
  - 2. Representations
    - a. rectangular components

- b. polar components
- c. exponential form
- 3. Graphical Methods
- 4. Algebraic Methods
- 5. DeMoivre's Theorem

E. Conic Sections

**Extra Topics (optional)**

- A. Computer Programming
- B. Computer Software Packages