COUNTY COLLEGE OF MORRIS
Course Information Outline

Course Title Applied Calculus **PREFIX&NUMBER** MAT 113

Lecture Hours 60 **Laboratory Hours** 0 **Credit Hours** 4 **Course Fee** None

Department Chairperson Approval J. Monaghan **Date** 05-25-2010

Division Dean Approval P. Enright **Date** 6/7/10

1. Catalog Course Description

A study of topics which provides a basis for continuing courses in mathematics and the physical sciences. This course includes trigonometric, exponential and logarithmic functions; analytic geometry; differentiation and integration.

2. Prerequisite(s)

MAT 110 or MAT 123

3. Co-requisite(s)

None

4. Textbooks

Washington, *Basic Technical Mathematics with Calculus*, 9th ed. (Addison-Wesley).

5. Supplementary Books and/or Materials

Martin, *Students' Solution Manual* (Addison-Wesley).

6. Specialized equipment, supplies, facilities, for classes limited by enrollment or restricted by accreditation and/or equipment limitations. (Information will be used to determine differential funding category.)

None

7. Course Content (List of Topics)

- Angles, trigonometric functions, function values, right triangles
- Signs of trigonometric functions, trigonometric functions of any angle, radians, applications of radians
- Oblique triangles, laws of sines and cosines
- Graphs of trigonometric functions
- Fundamental trigonometric identities
- Sum, difference, double-angle and half-angle formulas
- Trigonometric equations, inverse trigonometric functions
- Introduction to analytic geometry; lines, circles
- Limits, slopes; derivatives, implicit functions
- Tangents, normals, related rates, curve sketching

- Differentials, antiderivatives, indefinite integrals
- Areas, definite integrals
- Trapezoidal rule, some applications; areas, volumes
- Derivatives of the trigonometric functions
- Exponential and logarithmic functions and their derivatives

8. Statement of Course LEARNING OUTCOMES

- **Define, interpret** and **use** trigonometric, exponential and logarithmic functions
- **Recognize, solve** and **apply** trigonometric identities and equations
- **Identify** analytically and **describe** lines and circles
- **Define, interpret** and **calculate** limits and derivatives, and **apply** both the concepts to find slopes of tangent lines and **solve** rate problems
- **Define, interpret** and **calculate** integrals using various techniques including numerical integration, and **apply** these operations to solve geometrical and physical problems

9. Statement of Relation to Curriculum(s)

MAT 113 is required in the electronic engineering and mechanical engineering technology programs.

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Department Chairperson Approval J. Monaghan **Date** 04/23/2009

Division Dean Approval P. Enright **Date** 5/1/09

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