COUNTY COLLEGE OF MORRIS
Course Information Outline

Course Title Calculus with Applications to Business and Economics **PREFIX&NUMBER** MAT 118

Lecture Hours 45 **Laboratory Hours** 0 **Credit Hours** 3 **Course Fee** None

Department Chairperson Approval J. Monaghan **Date** 04-03-2009

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

1. Catalog Course Description

A course covering functions, derivatives, and integration, with special consideration of applications to the business and economics areas. Partial integration is introduced.

2. Prerequisite(s)

MAT 110 (grade of "C" or better) or equivalent.

3. Co-requisite(s)

None

4. Textbooks

Goshaw, *Concepts of Calculus with Applications* (Pearson Addison-Wesley).

5. Supplementary Books and/or Materials

Student's Solutions Manual and access to MyMathLab included with textbook purchased at the CCM Campus Store.

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)

- Linear and absolute value functions, nonlinear functions
- Rational and piecewise-defined functions
- Introduction to limits, continuity
- Rates of change and slope
- Introduction to the derivative, derivatives of algebraic functions
- Product, quotient and chain rules
- Higher-order derivatives, exponential and logarithmic functions, derivatives of exponential and logarithmic functions
- First derivative test and graphs of functions
- Second derivative test and graphs of functions
- Absolute extrema, optimization

- Business applications
- Implicit differentiation (omit related rates)
- Antiderivatives and integrals
- More rules for integration
- Substitution techniques for integration
- Definite integrals, areas and definite integrals
- Applications of definite integrals
- Differential equations
- Introduction to functions of more than one variable
- Partial derivatives
- Optimization (omit Lagrange multipliers)

8. Statement of Course LEARNING OUTCOMES

- **Differentiate** algebraic, exponential and logarithmic functions, including use of product, quotient, generalized power and chain rules.
- **Solve** application problems from business and economics involving graphing, minimization and maximization, economic lot size, and elasticity, using differentiation.
- **Integrate** functions using the basic rules of integration and substitution.
- **Solve** application problems from business and economics involving area, consumer's surplus and producer's surplus.
- **Find** first and second order partial derivatives for algebraic, exponential and logarithmic functions.
- **Solve** maximization and minimization problems using partial derivatives.

9. Statement of Relation to Curriculum(s)

MAT 118 is an optional course for business administration majors.