Department Master Syllabus

# Camden County College

**Blackwood, New Jersey**

**Course Title**: Applied Calculus

**Course Number**: MTH-122

**Department/Program Affiliation**: Mathematics

**Date of Review: 11/2018**

(This Department Master Syllabus has been examined by the program/department faculty members and it is decided that no revision is necessary at this time.)

**Date of Last Revision**: **11/2018**

(This Department Master Syllabus has been examined by the program/department faculty members and it is decided a change requiring a revision is necessary at this time.)

**N.B.** A change to the course materials alone (textbooks and/or supplementary materials) may not constitute a revision. Any other change to the items listed below on this form is considered a revision and requires approval by the program faculty at a Program/Department Meeting and by the division at a Chairs and Coordinator Meeting.

**Credits:** 3

**Contact Hours: Lecture 3 Lab 0 Other**

**Prerequisites**: MTH-114 (College Algebra for Business & Soc Sci) **OR** MTH-123(Precalculus Mathematics I) **OR**MTH-125 (Accelerated Precalculus**)**

**AND** ENG-013 (Reading Skills III) **OR** proper placement exam scores.

**Corequisites:** None

**Course Description:**

This course was developed for business and social science majors. Topics include functions, limits,

derivatives, maxima and minima problems, integration, and the application of the calculus

to problems in business and social sciences. Students are required to purchase a Texas

Instruments TI-83/84 or TI-83/84 Plus calculator.

**Course Student Learning Outcomes:** (Cognitive, Psychomotor, Affective Domains)

At the end of this course the student will be able to…

* Calculate limit of polynomial, rational functions, etc…, as assessed by tests, quizzes, homework, or projects.
* Find derivatives of non-trigonometric elementary functions and their sums, products, quotients, and compositions, as assessed by tests, quizzes, homework, or projects.
* Understand and apply symbolic notation of calculus, as assessed by tests, quizzes, homework, or projects.
* Solve practical optimization problems, as assessed by tests, quizzes, homework, or projects.
* Recognize basic business terms and formulas, as assessed by tests, quizzes, homework, or projects.
* Evaluate definite and indefinite integrals by using basic formulas and substitutions, as assessed by tests, quizzes, homework, or projects.
* Apply definite and indefinite integrals to business/economic problems, as assessed by tests, quizzes, homework, or projects.
* Apply Graphing calculators to solve applied problems, as assessed by tests, quizzes, homework, or projects.

**General Education Student Learning Outcomes:**

## Students will apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

**Course Outline:**

**Chapter 2:** **Limits and the Derivative**

1. Introduction to Limits
2. Infinite Limits and Limits at Infinity
3. Continuity
4. The Derivative
5. Basic Differentiation Properties
6. Differentials
7. Marginal Analysis in Business and Economics

**Chapter 3:** **Additional Derivative Topics**

1. The Constant *e* and Continuous Compound Interest

2. Derivatives of Exponential and Logarithmic Functions

3. Derivatives of Products and Quotients

4. The Chain Rule

5. Implicit Differentiation

1. Related Rates
2. Elasticity of Demand

**Chapter 4**: **Graphing and Optimization**

1. First Derivative and Graphs

2. Second Derivative and Graphs

3. L’Hôpital’s Rule (OPTIONAL)

4. Curve Sketching Techniques

1. Absolute Maxima and Minima
2. Optimization

**Chapter 5**: **Integration**

1. Antiderivatives and Indefinite Integrals

2. Integration by Substitution

3. Differential Equations; Growth and Decay

4. The Definite Integral

## 5. The Fundamental Theorem of Calculus

**Chapter 6:** **Additional Integration Topics (OPTIONAL)**

### Area Between Two Curves

1. Applications in Business and Economics

**Course Activities:**

1. Lecture Aided by Visual Aids and/or Computer Demonstrations and/or TI83 Graphing Calc.

2. Homework Assignments

3. Evaluation

a. Three or Four In-Class Tests

b. Final Exam (Optional)

1. Project (Optional)
2. Quizzes (Optional)

**Assessment of Student Learning Outcomes**: The student will be evaluated on the degree to which student learning outcomes are achieved. A variety of methods may be used such as tests, class participation, projects, homework assignments, etc. (there must be some evidence that the learning outcomes have been achieved.)

1. In-class tests and final exam

2. Quizzes when appropriate

3. Graded homework assignments when appropriate

4. Class attendance is up to instructor.

## **Grading:**

Grades will be based on the student’s performance in the above designated areas. Percentages will be assigned by each individual professor.

A 90 to 100

B 80 to 89

C 70 to 79

D 60 to 69

F Below 60

I Incomplete (only under extreme emergencies)

Must be completed within one semester.

NA Not Attending

XA Never Attended

W Withdraw (Be sure to notify the Registrar before the cutoff date.)

**Course Materials:**

**Textbook:** *Calculus for Business, Economics, Life Sciences, and Social Sciences,* by Barnett, Ziegler, and Byleen, Prentice Hall, current ed.