SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES
Mathematics
Revision Date: 07-01-23

I. CATALOG DESCRIPTION

Course Number:	MATH1400
Course Name:	Applied Calculus
Prerequisite:	A grade of "C" or higher in MATH1150 or MATH1300 or appropriate score on the math placement test.
Catalog Description:	Fundamentals of differential and integral calculus with emphasis on applications from business, economics and the life sciences. Not open to pre-engineering or pre-computer science majors.
Credit Hours:	3.0
Class Hours:	45
Lab Hours:	0
Total Contact Hours:	45

II. COURSE OBJECTIVES: *Course will*:

A. Introduce the two major branches of Calculus: The Derivative and The Integral.

B. Demonstrate the use of calculus techniques to solve problems in the fields of business, economics and life science.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. Student Learning Outcomes**:** *Student will be able to:*

1. Differentiate polynomial, rational, exponential and logarithmic functions using the power rule, product rule, quotient rule and chain rule.

2. Integrate a wide variety of functions using techniques such as u-substitution and integration by parts

3. Use techniques of calculus to solve optimization problems and problems in marginal analysis, identify local extrema, find area between curves.

B. General Education Learning Outcomes

1. GELO #5: Analytical, Quantitative, and Scientific Reasoning

Outcome: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.

Outcome: Effectively develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

A. Fundamentals of differential and integral calculus with emphasis on applications from business, economics and the life sciences.

B. Covered topics include

1. Limits
2. Continuity
3. Product and quotient rules
4. Chain rule
5. Marginal analysis
6. First and second derivative tests
7. Graphing rational functions
8. Locating extrema
9. Optimization problems
10. Continuous compound interest

11. Elasticity of demand
12. Exponential functions and their derivatives
13. Logarithmic functions and their derivatives
14. Implicit differentiation
15. Related rates problems
16. Indefinite integrals
17. Integration by substitution
18. Definite integrals
19. Area between curves
20. Integration by parts

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):

1. Barnett, Ziegler, Byleen, Stocker. *Calculus for Business, Economics, Life Sciences, and Social Sciences*, 14th Edition, Pearson, 2019.
ISBN-13: 978-0-13-466857-4. ISBN-10: 0-13-466857-X.

B. Other Resources:

1. None.

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. Lecture
2. Small group projects

VII. METHODS OF EVALUATION

A. Methods of evaluation typically include a combination of the following:

1. Attendance/Participation
2. Quizzes and/or homework
3. Exams
4. Comprehensive Final Examination

B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		

VIII. SPECIFIC COURSE REQUIREMENTS

A. A non-symbolic graphing calculator such as a TI-83, TI-84, or TI-86.