I. **TITLE OF COURSE: MA2304- Business Calculus**

II. **COURSE DESCRIPTION:** 4 credit hours of lecture per week. An introduction to calculus and the methods of calculus with applications to business, economics, the social and behavioral sciences, life sciences as in ecology, health, and agriculture and other fields. For the non-mathematics majors needing some skills of calculus. For each unit of credit, a minimum of three hours per week with one of the hours for class and two hours for studying/preparation outside of class is expected.
Pre-requisite: MA1173 - College Algebra or its equivalent.

III. **PROGRAM AND DEPARTMENT MISSION STATEMENT:** The Mathematics Department at Seward County Community College will enhance a student's ability to think critically using mathematical principals, ideas, and concepts in order to function in a society with ever-changing technology.

IV. **TEXTBOOK AND MATERIALS:**

  A. Larson, Ron**.** *Brief Calculus: An Applied Approach,* Houghton Mifflin Company, 8th edition, 2009.

  B. Texas Instruments 83, 83 plus, 84, or 84 plus Graphing Calculator.

V. **SCCC/ATS OUTCOMES:**

A. Outcome #4 - Demonstrate mathematical skills using a variety of techniques and technologies.

B. Outcome #5 - Demonstrate the ability to think critically by gathering facts, generating insights, analyzing data, and evaluating information.

VI. **COURSE OUTCOMES:**

Expected learning outcomes for this course are in alignment with the learning objectives established by the Statewide Core Competencies.

1. To evaluate limits of functions analytically, graphically, and numerically.
2. To utilize limits to determine continuity of a function at a point.
3. To determine differentiability of a function at a point.
4. To differentiate algebraic, exponential, and logarithmic functions.
5. To interpret derivatives as the slopes of tangent lines, instantaneous rates of change, and marginals.

6. To utilize algebra and derivatives to describe the behavior of functions and to graph functions.
7. To apply derivatives to problems including those in economics, business, and the sciences.
8. To calculate antiderivatives of algebraic and exponential functions.
9. To evaluate definite integrals using the Fundamental Theorem of Calculus and utilize techniques of integration.
10. To apply antiderivatives to problems including those in economics, business, and the sciences
11. To study functions of several variables using partial derivatives and double integrals.

VII. COURSE OUTLINE:
1. Review of algebra including graphs, functions, and applications, and study of limits and continuity.
2. The derivative defined as a limit. Development of the derivative of algebraic, exponential, and logarithmic functions. Differentiation techniques and higher order derivatives with their applications.
3. Applications of the derivative to related rates, curve analysis, optimization, marginals, differentials, and exponential growth and decay.
4. Integration is developed: antiderivatives as definite integrals, the Fundamental Theorem of Calculus, applications of integration, integration techniques, and numerical integration.
5. The study of functions of several variables including partial derivatives, extrema, and double integrals.

VIII. INSTRUCTIONAL METHODS:

A. Lecture. Material will be presented in class by illustrative examples.
B. Reading the Text. Students will be expected to read the text over topics before covering that material in class.
C. Student Questions. Students will be expected to write questions over each section and email those to the instructor before covering that material in class.
D. Class Discussion. Concepts, problems, and applications will be discussed each class period. Discussions may also be carried out over the World Wide Web.
E. Seat Work. Students will be given problems to do in class with instructor supervision.
F. Group Work. Students will be given opportunities to work in group settings on both new material and projects where concepts are applied.
G. Whiteboard Drill. This is used to reinforce concepts and check on the student's understanding.

H. Assignments. Homework will be assigned for each section covered.
I. Individual Help. The instructor is available during office hours and other free time to assist the student.
J. Examinations. Tests and quizzes are given frequently to inform the instructor and the student of progress toward the specific course competencies.

IX.   INSTRUCTIONAL AND RESOURCE MATERIALS:

A. Textbook
B. TI 83 Graphing Calculator
C. Supplemental materials prepared by instructor.
D. Supplemental materials available through the bookstore (optional.)
E. Whiteboard
F. Computer and Projector

X.   METHODS OF ASSESSMENT:

A. SCCC Outcome #2 will be assessed using the writing of mathematics on   class assignments and topic exams.
B. SCCC Outcome #4 will be assessed and measured by class participation, quizzes, and tests.
C. SCCC Outcome #5 will be assessed and measured by assignments, tests, and non-tradition problem solving activities.
D. SCCC Outcome #6 will be assessed and measured by students utilizing calculators to complete assignments.
E. SCCC Outcome #9 will be assessed through attendance and participation in group activities that require decision making and responsibility.

XI.   ADA STATEMENT: Under the Americans with Disabilities Act, Seward County Community College will make reasonable accommodations for students with documented disabilities. If you need support or assistance because of a disability, you may be eligible for academic accommodations. Students should identify themselves to the Dean of Students at 620-417-1106 or go to the Student Success Center in the Hobble Academic building, room 149 A.

XII.   CORE OUTCOMES PROJECT: The learning outcomes and competencies detailed in this course outline or syllabus meet, or exceed the learning outcomes and competencies specified by the Kansas Core

Outcomes Groups project for this course as approved by the Kansas Board of Regents KRSN: MAT2050

Syllabus Reviewed: 5/17/2022