

**SEWARD COUNTY COMMUNITY COLLEGE
COURSE SYLLABUS**

I. TITLE OF COURSE: MA2625- Calculus III

II. COURSE DESCRIPTION: 5 credit hours

5 credit hours of lecture and 0 credit hours of lab per week.

This course is a continuation of MA2615 in which the tools of differential and integral calculus are further developed. Study includes two- and three-dimensional vectors, vector functions, partial differentiation, multiple integration, and line integrals.

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: A grade of "C" or better in MA2615 - Analytic Geometry and Calculus II

III. PROGRAM AND/OR DEPARTMENT MISSION STATEMENT:

The Mathematics Department at Seward County Community College will enhance a student's ability to think critically using mathematical principles, ideas, and concepts in order to function in a society with ever-changing technology.

IV. TEXTBOOK AND MATERIALS:

1. Roland E. Larson, Robert P. Hostetler, and Bruce H. Edwards. Calculus, 10th ed. Cengage, 2014
2. TI-84+ and/or TI-89 graphing calculator

V. SCCC OUTCOMES

Students who successfully complete this course will demonstrate the ability to do the following SCCC Outcomes.

4. Demonstrate mathematical skills using a variety of techniques and technologies.
5. Demonstrate the ability to think critically by gathering facts, generating insights, analyzing data, and evaluating information.

VI. COURSE OUTCOMES:

1. To understand vectors in a plane and in space, perform operations on vectors and use these operations to solve problems.
2. To identify and sketch various surfaces in space (three dimensions).
3. To represent curves in polar coordinates (two dimensions) and cylindrical or spherical coordinates (three dimensions).
4. To utilize vector-valued functions to solve problems involving motion, arc-length, and curvature.
5. To extend concepts of calculus to functions of more than two variables, such as partial differentiation and how partials are used in determining gradient and directions derivatives.
6. To utilize partial differentiation in applied problems.
7. To understand the methods of multiple integration.
8. To utilize multiple integration in solving problems of area, density, mass, and volumes.
9. To understand the vector fields and line integrals and apply them to problems in math and physics.

VII. COURSE OUTLINE:

1. Two dimensions and three-dimensional spaces are considered with the scalar (dot) product of vectors, vector (cross) products, parametric equations of lines in space, planes in space and differentiation of vectors.
2. Cylinders and quadric surfaces are graphed, and cylindrical and spherical coordinate systems are used.
3. Vector-valued functions are used to represent curves in a plane or in space
4. Velocity and acceleration of an object in space is considered.
5. Limits and continuity in three dimensions is introduced.
6. Partial derivatives, definitions and operations as well as optimization problems using functions of several variables.
7. Multiple integration, region described iterated integrals, definitions and applications to areas, volumes, etc.
8. Triple integration with cylindrical and spherical coordinates considered.
9. Line integrals and work applications

VIII. INSTRUCTIONAL METHODS:

1. Lecture/Discussion
2. In class and out of class assignments
3. Calculator and computer exercises
4. Whiteboard drills
5. Calculator demonstrations
6. Quizzes and Examinations
7. Individual help

IX. INSTRUCTIONAL AND RESOURCE MATERIALS:

1. Textbook
2. Library mathematics reference books
3. Supplementary materials prepared by the instructor are available on Canvas
4. Computer tutorial programs
5. TI Smartview TI-84 emulator software
6. Computer projector, computer, and SMART Podium are used for computer demonstrations and class notes.

X. METHODS OF ASSESSMENT:

SCCC Instructional Outcome #4 will be assessed and measured by class participation, quizzes, and tests.
SCCC Outcome #5 will be assessed and measured using assignments, tests, and non-traditional problem-solving activities.

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 Hobbie Academic building, room 149 A.

Syllabus Reviewed: 5/16/2022