

MATH 283 – Calculus III (4 Credits)

DESCRIPTION:

Topics include vectors, differentiation and integration of vector valued functions, multivariable calculus, partial derivatives, multiple integrals, and applications.

Prerequisite: MATH 182 with a Grade of C or Better

OUTCOMES:

- a. Perform operations on vectors.
- b. Differentiate and integrate vector-valued functions.
- c. Analyze functions of several variables.
- d. Perform partial differentiation.
- e. Evaluate double and triple integrals.
- f. Analyze vector fields.
- g. Apply and extend all concepts.

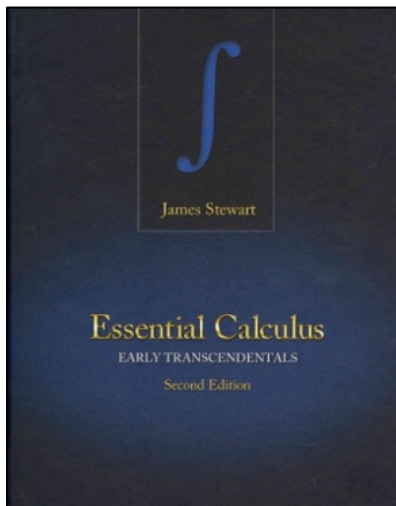
TEXT:

Title: *Essential Calculus: Early Transcendentals; 2nd Edition;

Author: James Stewart;

Publisher: Cengage;

ISBN-13: 9781133112280



*Note: Full-time instructors have the right to use no text or a different text.

OUTLINE:

- **Vectors:** Three-Dimensional Coordinate Systems, Vectors, The Dot Product, The Cross Product, Equations of Lines and Planes, Cylinders and Quadric Surfaces, Vector Functions and Space Curves, Arc Length and Curvature, Velocity and Acceleration (Stewart; Chapter 10)
- **Partial Derivatives:** Functions of Several Variables, Limits and Continuity, Partial Derivatives, Tangent Planes and Linear Approximations, The Chain Rule, Directional Derivatives and the Gradient Vector, Maximum and Minimum Values, Lagrange Multipliers (Stewart; Chapter 11)
- **Multiple Integrals:** Double Integrals over Rectangles, Double Integrals over General Regions, Double Integrals in Polar Coordinates, Applications of Double Integrals, Triple Integrals, Triple Integrals in Cylindrical Coordinates, Triple Integrals in Spherical Coordinates, Change of Variables in Multiple Integrals (Stewart; Chapter 12)
- **Vector Calculus:** Vector Fields, Line Integrals, The Fundamental Theorem for Line Integrals, Green's Theorem, Curl and Divergence, Parametric Surfaces and Their Areas, Surface Integrals, Stokes' Theorem, The Divergence Theorem (Stewart; Chapter 13)

EVALUATION:

Grades may be determined by student performance in one or more of the following areas: in-class tests, take-home tests, homework assignments, quizzes, special projects, papers, attendance, and class participation. Degree of importance and types of assessment used will depend on the instructor.

This course satisfies the math requirement in the General Education Core component for selected degree and certificate programs at CSN.