A. COURSE DESCRIPTION

Credits: 4
Lecture Hours/Week: 4
Lab Hours/Week: 0
OJT Hours/Week: *.*

Prerequisites:
This course requires the following prerequisite
MATH 2232 - Calculus II (Number of Years Valid: 5)

Corequisites: None

MnTC Goals: Goal 04 - Mathematical/Logical Reasoning

This course focuses on vectors, partial derivatives, multiple integration, and related applications. Multivariate calculus is the third course in the calculus series. It includes the study of line integrals, Green's Theorem, and Stokes' Theorem.

B. COURSE EFFECTIVE DATES: 05/02/2024 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Perform vector arithmetic in 3-dimensional space.
2. Calculate dot products and cross products of vectors.
3. Identify and write equations of lines, planes, cylinders, and quadric surfaces.
5. Integrate vector-valued functions.
6. Define and evaluate the limit of functions of more than one variable.
7. Calculate the derivative of functions of more than one variable and apply the chain rule.
8. Use partial derivatives to find extrema and tangent planes.
9. Calculate double integrals over rectangular and non-rectangular regions.
10. Calculate line integrals.
11. Define and determine divergence and curl for given vector fields.
12. Identify and apply Green's Theorem and Stokes' Theorem.

D. LEARNING OUTCOMES (General)

1. Calculate dot and cross products of vectors.
2. Differentiate and integrate vector-valued functions.
3. Calculate partial derivatives and perform multiple integration on functions of more than one independent variables.
4. Solve problems in physics by applying the concepts of vectors, partial derivatives, and multiple integration.
E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
   Goal 04 - Mathematical/Logical Reasoning
   1. Illustrate historical and contemporary applications of mathematical/logical systems.
   2. Explain what constitutes a valid mathematical/logical argument (proof).
   3. Apply higher-order problem-solving and/or modeling strategies.

F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted