MTH 241 - CALCULUS III

Course Description

The course covers multivariable calculus including three-dimensional analytical geometry, vector valued functions, partial differentiation, and multiple integration (with applications of each), and vector calculus. Group 1 course.

Credit Hours

5

Contact Hours

5

Lecture Hours

5

Required Prerequisites

A grade of 2.0 or better in MTH 142 or equivalent

Recommended Prerequisites or Skills Competencies

Placement into ENG 111

General Education Outcomes supported by this course

Quantitative Reasoning

Course Learning Outcomes

Knowledge:

- Graph both space curves and surfaces in three dimensions in rectangular, cylindrical, or spherical coordinates.
- Demonstrate proper use of vectors and vector valued functions, including dot and cross products, equations of lines, planes and curves in space.
- Compute partial derivatives to find the gradient vector, directional derivatives, and to maximize or minimize a function of multiple variables using both the extreme value theorem and Lagrange multipliers.
- Write and evaluate double and triple integrals to find surface area, volume, length of curve and work.
- Learn the concepts and theorems of vector calculus, including line integrals, divergence, curl and surface integrals.

Application:

- Perform proper operations on functions to find extrema and tangent approximations.
- Determine the most effective coordinate system to use to evaluate an iterated integral.
- Discern the proper order and limits of an iterated integral.
- Appropriately use Stoke's Theorem and the Divergence Theorem.

Integration:

- Represent multidimensional physical relationships and use calculus theory and techniques to solve them.

Human Dimension:

- Identify their mathematical strengths and weakness and recognize they can overcome their weaknesses.
- Collaborate with peers during group work.

Caring - Civic Learning:

- Collaborate with peers during group work.

Learning How to Learn:

- Recognize the impact mathematics plays in civic situations such as politics, education and income.
- Reflect on failure and revise appropriately.