MTH 255 : VECTOR CALCULUS II

Transcript title

Vector Calculus II

Credits

4

Grading mode

Standard letter grades

Total contact hours

60

Lecture hours

30

Lab hours

30

Prerequisites

MTH 254.

Course Description

Continues the study of vector analysis for science and engineering students. Includes double and triple integrals with applications to area, volume, and center of mass; introduction to vector analysis including divergence, curl, line integrals and work, surface integrals; conservative fields and the theorems of Green and Stokes. Uses graphing technology.

Course learning outcomes

1. Analyze double and triple integrals in rectangular, polar, cylindrical, and spherical coordinate systems in the context of various applications.
2. Analyze various vector fields.
3. Evaluate line integrals in scalar and vector fields.
4. Analyze parametric surfaces in scalar and vector fields.

Content outline

1. Evaluate double and triple integrals in rectangular, polar, cylindrical, spherical coordinate systems, and by using the Jacobian
2. Applications of double and triple integrals for finding volume, surface area, mass and center of mass
3. Vector fields: curl, gradient, divergence, and determine if the field is conservative or not
4. Line integrals in scalar and vector fields
5. The fundamental theorem of line integrals
6. Parametric surfaces: in a scalar field, in a vector field, and area
7. Green's and Stokes' theorems

Required materials

This class requires a textbook and access to graphing technology.

General education/Related instruction lists

- Mathematics