

*Montgomery College - Department of Mathematics
Takoma Park/Silver Spring Campus*

**MA280 – Multivariable Calculus
4 Semester Hours**

Description Calculus of vector functions; analytic geometry of space; partial differentiation; multiple integrals; classical theorems of Green, Gauss, and Stokes.

MA280 meets for 5 hours each week.

Matlab, Derive, and Scientific Notebook will be used in the course.

Prerequisites A grade of C or better in MA 182 or equivalent or consent of department.

- Topics**
- I. Vectors and the Geometry of Space
 1. Three-Dimensional Coordinate Systems
 2. Vectors
 3. The Dot Product
 4. The Cross Product
 5. Equations of Lines and Planes
 6. Surfaces
 7. Cylindrical and Spherical Coordinates
 - II. Vector Functions
 1. Vector Functions
 2. Space Curves
 3. Derivatives and Integrals of Vector Functions
 4. Arc Length and Curvatures
 5. Motion in Space
 6. Parametric Surfaces
 - III. Partial Derivatives
 1. Functions of Several Variables
 2. Limits and Continuity
 3. Partial Derivatives
 4. Tangent Planes and Linear Approximations
 5. The Chain Rule
 6. Directional Derivatives and the Gradient Vector
 7. Maximum and Minimum Values
 8. Lagrange Multipliers

- IV. Multiple Integrals
 - 1. Double Integrals
 - 2. Iterated Integrals
 - 3. Double Integral in Polar Coordinates
 - 4. Surface Area
 - 5. Triple Integrals
 - 6. Triple Integrals in Cylindrical and Spherical Coordinates
 - 7. Change of Variables
- V. Vector Calculus
 - 1. Vector Fields
 - 2. The Fundamental Theorem of Line Integrals
 - 3. Green's Theorem
 - 4. Stokes' Theorem
 - 5. The Divergence Theorem

Text

Vector Calculus 3rd Edition by Susan Jane Colley. Prentice-Hall Publishing Company.