Mathematics Department
Brooklyn College, City University of New York
Mathematics 2201 (Multivariable Calculus)
4 Hours; 4 Credits

The order in which these topics are to be presented is left to the instructor's discretion.
Topics preceded by an * are optional.

Vectors

Three dimensional coordinate systems
Introduction to vectors
Vector algebra: dot product; cross product
Quadric surfaces
Vector-valued functions
Vector calculus
Arc length; curvature; unit normal
Motion in space; velocity and acceleration

Partial Derivatives

Functions of two or more variables
Limits and continuity
Partial differentiation
Tangent planes
Differentials
Chain rule; implicit differentiation
Directional derivatives; gradients

Multiple Integrals

Double integrals over rectangles; volumes
Iterated integrals
Integration over general regions
Double integrals in polar coordinates
*Moments of inertia; surface area
Triple integrals
Triple integrals in cylindrical and spherical coordinates

Topics in vector calculus

Vector fields
Line integrals
Fundamental theorem of line integrals
Green's theorem
*Curl and divergence; Surface area; Surface integrals, Stokes' theorem

Approved by the Mathematics Department Curriculum Committee, November 26, 2013.