UNIVERSITY OF CALGARY

FACULTY OF SCIENCE
Department of Mathematics and Statistics

Applied Mathematics 309 Vector Calculus for Engineers

Functions of several variables, chain rule and differentials. Vector calculus, line, surface and volume integrals, Green's, Gauss' and Stokes' theorems. Students will complete a project using a computer algebra system.
Course Hours: H(3-1.5T)
Prerequisite(s): Applied Mathematics 219 or Mathematics 114 and one of Mathematics 253 or 263 or 283.
Antirequisite(s): Credit for more than one of Mathematics 353, 381, and Applied Mathematics 309 will not be allowed.

Syllabus

Topics	**Number of hours**
Surfaces -- cartesian, cylindrical and spherical coordinates	3
Vector-valued functions, limits, derivatives, integrals, space curves, curvature, motion, tangential and normal components of acceleration, applications	6
Review of functions of several variables, differentials, partial derivatives, chain rule	4
Directional derivatives, tangent planes, extrema of functions of several variables, Lagrange multipliers, method of least squares, applications	6
Review of multiple integration	4
Vector fields, line integrals, independence of path, Green's theorem, surface integrals, divergence theorem, Stoke's theorem, applications	13
TOTAL HOURS	**36**

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