Douglas College

A. Division: Instructional Effective Date: January 2003

B. Department / Mathematics Revision ☒ New Course ☐
Program Area:

If Revision, Section(s) G,J,L,M, N,O,P,Q
Revised:
Date of Previous Revision: May 1993
Date of Current Revision:

C: Math 321 **D:** Calculus III **E:** 3

Subject & Course No.	Descriptive Title	Semester Credits

F: Calendar Description: This course extends the theory of differential and integral calculus to functions of many variables. Topics include the study of vectors, quadric surfaces, vector functions, cylindrical and spherical coordinates, partial derivatives, multiple integrals, vector fields line integrals; all with applications.

G: Allocation of Contact Hours to Type of Instruction / Learning Settings

Lecture 3 – 4 hours/week
Tutorial/Lab 0 – 1 hours/week

Primary Methods of Instructional Delivery and/or Learning Settings:

Number of Contact Hours: (per week / semester for each descriptor)

4 hours/week

Number of Weeks per Semester:

15

H: Course Prerequisites: Math 220

I: Course Corequisites: Math 232 (recommended)

J: Course for which this Course is a Prerequisite

Math 440

K: Maximum Class Size: 35

L: PLEASE INDICATE:

☐ Non-Credit SFU 251(3) UVic 200(1.5)

☐ College Credit Non-Transfer UBC 200(3) UNBC 200(3)

☒ College Credit Transfer:

SEE BC TRANSFER GUIDE FOR TRANSFER DETAILS (www.bccat.bc.ca)

M: Course Objectives / Learning Outcomes

At the completion of the course a student will be expected to:

use vector notation and the properties of vectors
use vectors to describe various physical quantities (position, velocity, acceleration...)
compute dot and cross-products and verify and use properties of these products
determine angle/orientation between two vectors or one vector and standard basis vectors
find scalar and vector projection of one vector onto another
use vector operations to find area and volume defined by sets of vectors
find vector, parametric or symmetric representations for an equation of a line in R^3
determine whether two lines are

N: Course Content:

1. Properties and applications of points, curves and surfaces for various coordinates in R^3.
2. Operations, properties and applications of vectors and vector functions.
3. Partial Derivatives: Limits, partial derivative rules and properties, gradients and optimization principles. Applications.
4. Multiple Integrals: Double and triple integrals over general domains in appropriate coordinate systems (rectangular, polar, cylindrical, spherical or other defined coordinates). Applications.
5. Vector Calculus: Vector fields, line integrals, Fundamental Th