Synopsis:

This book is written for students who take Engineering Mathematics subject in Engineering Faculties at Universiti Teknologi Malaysia. The book is also suitable for science students who study mutivariable and vector calculus in higher learning institutions.

The emphasis of this book is on the geometrical approach. Whenever possible, figures are used in this book to help students understand the concept under discussions. An appendix has been prepared by the authors for readers to recall elementary facts used in the book.

Multivariable \& vector calculus

Table Of Content:

Preface

# CHAPTER 1 MULTIVARIABLE FUNCTIONS 

Functions of Two Variables
Common Surfaces
Functions of Three Variables
Limits and Continuity

CHAPTER 2 PARTIAL DERIVATIVES
Partial Derivatives
Increments and Differentials
Chain Rule
Local Extrema
Absolute Extrema
Lagrange Multipliers

## CHAPTER 3 DOUBLE INTEGRALS

Double Integrals in Cartesian Coordinates
Iterated Integrals
Fubini's Theorem in Cartesian Coordinates
Double Integrals in Polar Coordinates
Moments and Centre of Mass of Laminas

## CHAPTER 4 TRIPLE INTEGRALS

Triple Integrals in Cartesian Coordinates
Triple Integrals in Cylindrical Coordinates
Triple Integrals in Spherical Coordinates
Moments and Centre of Mass of Solids

## CHAPTER 5 VECTOR FUNCTIONS

Vector Functions
Calculus of Vector Functions
Tangents and Curvatures

CHAPTER 6 SCALAR AND VECTOR FIELDS
Gradients of Scalar Fields
Divergence of Vector Fields
Curl of Vector Fields
Properties of Del

## CHAPTER 7 LINE INTEGRALS

Line Integrals of Scalar Fields
Line Integrals of Vector Fields
Green's Theorem
Conservative Fields

## CHAPTER 8 SURFACE INTEGRALS

Surface Integrals of Scalar Fields

Surface Integrals of Vector Fields
Stokes' Theorem
Gauss' Theorem

Answers to Odd-Numbered Questions
Appendix
Bibliography
Index

