



Mathematics 177

Further Topics from Mathematics 277

(see Course Descriptions for the applicable academic year: <http://www.ucalgary.ca/pubs/calendar/>)

*Syllabus*

**Topics**

**Number of  
Hours**

Vector functions and differentiation, curves and parametrization

4

Review of Functions of several variables, partial differentiation, Chain Rule

2

Linear approximation, differentiability, differentials, gradient and directional derivative, implicit functions

5

Extreme values on restricted domains, Lagrange Multipliers.

5

**TOTAL HOURS**

**16**

## MATH 277: Calculus for Engineers and Scientists

### COURSE OUTCOMES

Upon Successful Completion of the Course, Students will be able to:

1. Adapt to the terminology, vocabulary of multivariable calculus and recognize wide range of symbols it employs.
2. Develop an understanding of the key concepts of multivariable calculus and use to compute Limits, Partial Derivatives, Directional Derivatives and Multiple Integrals of functions of several variables.
3. Use available tools such as Implicit function Theorem to significantly reduce the complexity of calculations particularly for Multiple Integrals.
4. Perform calculus techniques to solve a wide variety of optimization problems.
5. Analyze appropriate real-world problems in interdisciplinary fields.
6. Explore the relationship between key multivariable calculus concepts and its geometric representation for an enhanced interpretation of certain physical or natural property.

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