

# COURSE SYLLABUS

Multivariable Calculus

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HOURS AND TERM: Wed 3:30–4:30, Spring 2017

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## Description

This course is a continuation of calculus taught in the IB diploma program. In particular, a good knowledge in vector algebra and integral calculus is required. The course examines functions whose domain and range are not necessarily of one dimension. For example, we will look at functions like  $f : \mathbb{R}^3 \rightarrow \mathbb{R}$ , or vector fields like  $f : \mathbb{R}^2 \rightarrow \mathbb{R}^3$ , and do calculus on them. This leads to the generalizations of the Fundamental Theorem of Calculus in multiple dimensions.

## Organization

The course meets only once a week for one hour; hence, it will be entirely lecture style. There will be one problem set per week, and is due at the next lesson. Midterm and final exams are given as take-homes.

## Topics

The course will tentatively cover, but not restricted to, the following topics:

1. Partial derivatives
  - Calculus on functions of several variables
  - Lagrange multipliers and constrained optimization
2. Multiple integrals
  - Double and triple integrals
  - Substitution in multiple integrals
3. Integration in vector fields
  - Vector valued functions and line integrals
  - Green's Theorem, Stokes' Theorem, and Divergence Theorem

## Grading

Coursework will be weighted as follows:

Homework: 50%  
Midterm: 20%  
Final: 30%