

**Pomona College**  
**Department of Mathematics**  
**Mathematics 107. Vector Calculus**

**Spring 2009**

**Course Outline**

|                        |   |
|------------------------|---|
| <b>Time and Place:</b> | MW 2:45 pm - 4:00 pm Millikan 134   |
| <b>Instructor:</b>     | Dr. Adolfo J. Rumbos  |
| <b>Office:</b>         | Andrew 259  |
| <b>Phone / e-mail:</b> | ext. 18713 / arumbos@pomona.edu   |
| <b>Office Hours:</b>   | MWF 9:15 am - 9:50 am, Tu 9:15 am – 10:50 am, or by appointment                                       |
| <b>Text:</b>           | <i>Second Year Calculus</i> by David M. Bressoud<br>Undergraduate Texts in Mathematics, Springer 2000 |
| <b>Prerequisites:</b>  | Math 60 (Linear Algebra) or equivalent course.  |

**Course Description.** The main goal of this course is the development of differential and integral calculus ideas, which students learned in a single-variable calculus courses, in dimensions higher than 1. The main objects of study are functions from  $n$ -dimensional Euclidean space to  $m$ -dimensional Euclidean space (also known as **Vector Fields**) and their differentiation and integration properties. We will also be concerned with the study of subsets of Euclidean space on which those functions act. The culmination of the course will be the multivariable version of the **Fundamental Theorem of Calculus** (also known as the generalized **Stokes' Theorem**). In the process leading to Stokes' Theorem, the machinery of **differentiable manifolds** and **differential forms** will be introduced and developed.

The specific topics to be covered are listed in the attached [Tentative Schedule of Lectures and Examinations](#).

**Assigned Readings and Problems.** Readings and problem sets will be assigned at every lecture. Homework assignments will be collected on an alternate basis. Students are strongly encouraged to work on every assigned problem. **Late homework assignments will not be graded.**

**Grading Policy.** Grades will be based on the homework, two 75-minute examinations, plus a comprehensive final examination. The grades will be computed as follows:

|                     |     |
|---------------------|-----|
| homework            | 20% |
| Two 75-minute exams | 50% |
| final examination   | 30% |

**Final Examination.**

Time: Friday, May 15 2:00 pm  
Place: Millikan 213