

MULTIVARIABLE CALCULUS SYLLABUS

1. INTRODUCTION

Welcome to Math 13. I am your guide in the wonderful world of vector calculus, think of it as Math 3 with 3-D goggles on.

The good news is that if you survived Math 8 or 9 with all limbs intact, you should have a relatively painless experience in this class.

2. CLASS INFORMATION

Meeting Times: Slot 12. 12:30-1:45, MWF, 1:00-1:50 Tuesdays. Please be punctual.

Homework: Will be collected at the beginning of class.

T.A.: Francois Dorais

Tutorial Room: Bradley 104

Tutorial Time: 7-9 S,T,Th

Text: Stewart: 4th Edition [$< --$ A favor to those who took Math 8 or 9 and still have the book]

Webpage: <http://math.dartmouth.edu/m13s03> Professor: David Rudel, Office A1 [as in the steak sauce]

Email: Rudel@dartmouth.edu

Office Hour: Monday 4-5, Friday 3-4, or by appointment.

3. GRADING

Your grade is intended to reflect your mastery of the subject-matter. As there are many levels of mastery, the grading scale is designed to let each student exhibit whatever degree of mastery he has achieved. With that in mind, the following rubric is adopted:

500 points are available from in-class quizzes and homework assignments.

500 points are available from mid-terms and the final*.

*** Except for extreme circumstances, your final grade will never be less than your score on the final, nor more than one grade level higher than your grade on the final.** Thus, essentially the daily quizzes are weighted more to give students the opportunity to show mastery of low-level concepts while the final allows students to show mastery of high-level concepts.

4. SCHEDULE

This is an approximate schedule, see webpage for a more comprehensive version.

Week 1: Review of important material from Math 8/9

- Vectors
- Dot and Cross Product
- Equations of surfaces
- Tangent and Normal Vectors
- Gradient

Week 2: Curves in space (1-manifolds)

- Parametrization
- Speed and Arc Length
- Line Integral
- Differentiation Rules for Vector-valued Functions

Week 3: Curves continued

- Potential
- Curl
- Conservative Fields

Midterm

Week 4: Planar Calculus.

- Derivative matrix
- Change of Variables
- Chain Rule
- Double Integrals
- Jacobian

Week 5: Surface Integrals and 3-D integration

- Parametrization
- Surface Integrals
- Laplacian

Weeks 6: Triple integrals start FTC.

- Triple Integrals

Midterm

- Divergence
- Div, Grad, Curl revisited.

Week 7: FTC

- FTC

Week 8: Finish FTC

- Finish FTC
- Forms [maybe]

Midterm

Week 9: The derivative revisited

- The derivative as a linear operator

- non-differentiability

Week 10: Potpourri

- Newtonian Mechanics
- ?

5. DISABILITIES

Those with diagnosed learning disabilities should contact the professor as early as possible so that appropriate accommodations can be made.

6. HONOR PRINCIPLE

No reception of assistance, coerced, unwitting, or voluntary, is allowed in any form on daily quizzes, mid-terms, or the final. You may confer with one another when attempting the homework **but you are required to acknowledge such assistance at the top of your homework**. A simple "I worked with X" or "I received help from Y" suffices.