

Math 223 - Multivariable Calculus
Fall Term 2007
Course Description

September 25, 2007

Instructor: John Schmitt

Warner 311, Ext. 5952

jschmitt@middlebury.edu

Office Hours: Monday 1:30-3pm, Wednesday 1:30-3pm, Thursday 11am-12pm, or by arrangement

Meeting Times:

Section A

MWF, 11:15 am - 12:05 am Warner 507

Textbook: Susan Colley *Vector Calculus, 3rd edition*, Pearson-Prentice Hall, 2006.

Homework: Homework will be assigned on a daily basis. The content of this course is best learned by *practicing problems*. I **encourage you to work together**. However, the write-up of homework solutions *should be done on your own*. Homework will be collected three times a week, on Monday, Wednesday and Friday.

Quizzes: I reserve the right to give quizzes. If given, they will be short in length and cover recent homework problems. They will generally be announced beforehand.

Additional Resources

- Text available in The Un-named Library: James Stewart, *Multivariable calculus: concepts and contexts*, Brooks-Cole, 2001.
- Text available in The Un-named Library: H.M. Schey, *Div, grad, curl and all that: an informal text on vector calculus*, W.W.Norton, New York, 1997.
- Text available in The Un-named Library: J. Marsden, A. Tromba, *Vector Calculus, 3rd edition* W.H. Freeman, New York, 1988.

- The software package Maple is available on many computers throughout campus. Version 10 is now available (Version 11 coming soon?) and should facilitate computations and drawing when appropriate. Other software packages may also be useful, including Mathematica and MATLAB.

Special Needs: If you require special arrangements for class or during tests/exams please talk to me as soon as possible to make such arrangements.

Grading Percentages:

Homework/Quizzes	10
Class Participation	10
Midterms	50
Final	30

The lowest homework score will be dropped from consideration.

Assignment of Grades:

The assignment of grades will follow the scheme below.

90 and above	A
80 - 89	B
70 - 79	C
60 -69	D
below 60	F

Plus and minus will be assigned at my discretion.

Midterm Exams: Midterm on Chapters 1 and 2: week of October 8th

Midterm on Chapters 3 and 4: week of November 5th

Final Exam: Thursday, December 13, 7-10pm in Warner 507

Absences: Please see me as far in advance as possible for absences that will occur on the day of an exam. Any such absences, or unforeseen ones, must be documented in writing by the appropriate person.

Honor Code: The Honor Code will be observed throughout this class and for all examinations. If you have a question about how the Honor Code applies to this class please ask.

Course Webpage: Problem sets and syllabi and other relevant material will be posted on a course website, available by linking from my homepage:

<http://community.middlebury.edu/~jschmitt/>.

Multivariable Calculus - Course Content

1. Vectors: the dot product and cross product
2. Differentiation in Several Variables
 - Functions of several variables
 - Limits
 - The derivative
 - Higher-order Partial Derivatives
 - The Chain Rule
 - Directional Derivatives and the Gradient
3. Vector-valued functions
 - Parametrized Curves
 - Arclength and differential geometry
 - Vector fields
 - Gradient, Divergence, Curl and the Del operator
4. Maxima and minima in several variables
 - Differentials and Taylor's formula
 - Extrema
 - Lagrange multipliers
 - Applications
5. Multiple Integration
 - Areas and volumes
 - Double integrals
 - Triple integrals and change of variables
6. Line Integrals
 - Scalar and vector line integrals
 - Green's theorem
7. Surface Integrals and Vector Analysis (time permitting)
 - Parametrized Surfaces
 - Surface Integrals
 - Stoke's and Gauss' Theorem