Math 223 - Multivariable Calculus
Fall Term 2012
Course Description

September 7, 2012

Instructor: John Schmitt
Warner 311, Ext. 5952
jschmitt@middlebury.edu
Office Hours: Monday 1:30-2:45pm, Tuesday 1:30-3pm, Friday 1:30-2:45pm, when my office door is open or by arrangement

Meeting Times:
Section A
MWF, 11:15am – 12:05am in Warner 202


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. Generally, homework will be collected three times a week, on Monday, Wednesday and Friday. Please see my accompanying “thoughts” on homework.

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:
Texts on reserve in the Davis Family Library:


• The software package Maple is available on many computers throughout campus. Version 16 is now available 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:**

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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Homework/Quizzes</td>
<td>10</td>
</tr>
<tr>
<td>Class Participation</td>
<td>10</td>
</tr>
<tr>
<td>Midterms</td>
<td>50</td>
</tr>
<tr>
<td>Final</td>
<td>30</td>
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The lowest homework score will be dropped from consideration.

**Assignment of Grades:**

The assignment of grades will follow the scheme below.

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90 and above</td>
<td>A</td>
</tr>
<tr>
<td>80 - 89</td>
<td>B</td>
</tr>
<tr>
<td>70 - 79</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69</td>
<td>D</td>
</tr>
<tr>
<td>below 60</td>
<td>F</td>
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Distinction of plus or minus will be determined at the completion of the course.

**Midterm Exams:** Midterm on Chapters 1 and 2: Thursday, October 11th, 7–9pm
Midterm on Chapters 3 and 4: Thursday, November 15th, 7–9pm

**Final Exam:** The final exam will be given on Wednesday, December 12, 7pm-10pm, only.

**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