Math 550 (§501) – Vector Analysis

Instructor   Professor Doug Meade
    Office Hours: TTh 10:00a.m.–11:00a.m.
                  W 11:00a.m.–12:30p.m.
                  or by *prior* appointment
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WWW URL   `http://www.math.sc.edu/~meade/math550-S09/`

Meeting Times TTh 11:00a.m.–12:30p.m., LC 303B

Text   Marsden and Tromba, *Vector Calculus*, Fifth Edition, Freeman, 2003.

Prerequisite   A grade of C or better in Math 241.

Course Content

This is a continuation of Math 241 — Vector Calculus. Our primary focus is to understand, and to apply, the "big 3" integral theorems of vector analysis: Green's Theorem, Stokes' Theorem, and Gauss' Theorem.

To prepare for these theorems we will start with a quick review of paths, curves, vector fields, directional derivatives, gradients, divergence, and curl (Chapters 2 and 4). The majority of our time will be spent talking about maps, change of variables, multiple integration (all from Chapter 6), and parameterized surfaces, line, path, and surface integrals (from Chapter 7). The "big 3" are covered in Chapter 8.

Learning Outcomes

Successful students in Vector Calculus will

- learn key theories, concepts, and methods of inquiry in Vector Analysis, including: multivariate change of variables formula, applications of multiple integrals, integrals over paths and surfaces, and the integral theorems of vector analysis. Green's Theorem, Stokes' Theorem, and Gauss' Theorem.
- learn how to solve problems in Vector Analysis by completing weekly homework assignments in problem solving. Students will be able to solve problems using appropriate technology, translating problems from one form to another, and using various problem-solving strategies.
- learn to think critically about Vector Analysis by applying theories, concepts, and methods of inquiry in Vector Analysis to novel problems, to other disciplines, and to situations that require understanding rather than rote memory.
- have mastered and, where appropriate, memorized material from the Calculus sequence.

Study Hints   Reading the material **in advance** of the lecture is strongly encouraged. Benefits of this preparation include obtaining a familiarity with the terminology and concepts that will be encountered (so you can distinguish major points from side issues), being able to formulate questions about the parts of the presentation that you do not understand, and having a chance to review the skills and techniques that will be needed to apply the new concepts.

　　Finally, as previously mentioned, you are assumed to have a mastery of the topics in MATH 241 (and 142 and 141 and ...). If you are not comfortable with your basic Calculus skills, please discuss your concerns with me before they become a problem.

Grading   Your grade in this course will be based on your performance on homework, two (2) mid-term exams, and a final exam. The weights assigned to each of these components will be:

Homework	20%
Mid-term exams (2)	40%
Final exam	40%

Course grades will be determined according to the following scale:

A	90 –100
B	80 – 89
C	70 – 79
D	60 – 69
F	0 – 59

The deadline to drop this course with a grade of W is Monday, February 23, 2009.

Exams   *Tentative* dates for the mid-term exams are:

Tuesday, February 17	Chapter 6+
Thursday, April 9	Chapter 7+

Make-up exams will be given only for documented reasons of illness, family emergency or participation in a University sponsored event. Excuses such as oversleeping, forgetting the time or location of the exam, and lack of studying are explicitly noted as unacceptable grounds for a make-up exam.

A comprehensive final will be given at 9:00A.M. on Wednesday, April 29, 2009.

Homework   Problems will be assigned for each section. All problems assigned on or before Tuesday's class will be due on the Friday of that week. (You will have a chance to ask questions in Thursday's class.)

Calculators   Calculators cannot be used on any exam.

Attendance   Attendance at every class meeting is important – and expected. Students missing more than 10% of the class meetings (4 days) can have their grade lowered.

Academic Honesty

Cheating and plagiarism will not be tolerated. You may discuss homework problems with others, but do not copy work from another student or from a book. Violations of this policy will be dealt with according to University guidelines.