

MATH 241 (Section 502) – Vector Calculus

Instructor	Professor Doug Meade Office Hours: TBD and by <i>prior</i> appointment Office: LeConte College 300E E-mail: meade@math.sc.edu
WWW URL	http://www.math.sc.edu/~meade/math241-F10/
Meeting Times	MWF 11:15AM– 12:05PM, LC 121
Text	James Stewart, <i>Calculus, Early Transcendentals</i> , Sixth Edition, Cengage Learning, 2009.
Prerequisite	Completion of MATH 142 with a grade of C or better; or consent of the Mathematics Department.
Overview	<p>The main topics in this course are the same as in the first two courses in this sequence: limits, derivatives, integrals, and applications of these concepts. The new component of this journey is that the functions depend on more than one variable and/or are vector-valued. To make sense of general n-space, we start with a basic introduction to two- and three-space.</p> <p>Differential calculus in n-space is very similar to that in one variable. The same rules will be used and we will be able to solve many optimization problems.</p> <p>Integral calculus in n-space is fundamentally quite different in n-space. Instead of integrating over an interval, we can think about integrating over a 2-d region of the plane, a 3-d solid in 3-space, along a line, or over the surface of a solid. The fortunate aspect of this is that, when thought about in the proper way, each of these types of integrals can be evaluated using our standard one variable methods. We will work to develop a proper understanding of these integrals. Another component of understanding these integrals is knowing what the theorems of Green, Gauss, and Stokes say and how to use them.</p>
Course Content	<p>Chapters 12 — 16 of the text correspond to this material. Here is a breakdown of the major topics in each chapter.</p> <p>Chapter 12: Vectors and the Geometry of Space</p> <ul style="list-style-type: none">• vectors• dot and cross products• lines and planes• cylinders and quadric surfaces <p>Chapter 13: Vector Functions</p> <ul style="list-style-type: none">• vector functions and space curves• arclength and curvature• curvilinear motion in space <p>Chapter 14: Partial Derivatives</p> <ul style="list-style-type: none">• partial derivatives• directional derivatives and gradients• optimization and Lagrange multipliers <p>Chapter 15: Multiple Integrals</p> <ul style="list-style-type: none">• double and triple integrals• iterated integrals• multiple integrals in other coordinates <p>Chapter 16: Vector Calculus</p> <ul style="list-style-type: none">• vector fields• line integrals and independence of path• Green's Theorem• curl and divergence• parametric surfaces and their areas• surface integrals• Stokes' Theorem

Grading

Your grade in this course will be based on your performance on homework, quizzes, three (3) mid-term exams, and a final exam. The weights assigned to each of these components will be:

Homework	5%
Quizzes	10%
Mid-term exams (3)	60%
Final exam	25%

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

Note that the deadline to drop this course with a grade of W is Thursday, October 7, 2010.

Exams

There will be three (3) exams during the semester. *Tentative* dates and topics for these exams are:

TBD	Chapters 12 and 13
TBD	Chapters 14 and 15
TBD	Chapters 15 and 16

There will be no make-up exams. If you miss one exam due to a documented reason of illness, family emergency or participation in a University sponsored event, your score on the final exam will be used to replace the missing exam score. Excuses such as oversleeping, forgetting the time or location of the exam, and lack of studying are explicitly noted as unacceptable grounds for missing an exam.

A comprehensive final will be given at 9:00AM on Thursday, December 9, 2010.

Homework

Homework will be assigned, and graded, through WebAssign (<http://www.webassign.net/>). The class key for WebAssign will be announced when it is made known to me.

You are responsible for completing all assigned work on time. It is a good idea to print copies of your work. Please report any difficulties that you have with this system as soon as possible. Some, but not all, of the assigned problems may be discussed in class or recitation.

Quizzes

Quizzes will be given weekly. Each quiz will consist of one or two problems similar in nature to the homework problems. Your quiz grade will be computed by your ten (10) highest quiz scores. *No make-up quizzes will be permitted.*

Study Hints

Before each class, you should both review the material from recent sections and read the section to be discussed that day. This will allow you to both understand my presentation of new material and identify questions that you have about earlier material.

Attendance

Regular class attendance 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 will be working in groups in class and are encouraged to discuss homework problems with others. You will have to take all quizzes and exams on your own. Violations of this policy will be dealt with in a manner consistent with University guidelines.