

Math 20E Vector Calculus Winter 2005

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Office Hours:	M 11:00a-11:59a, Tu 1:10p-2:00p, or by appointment
Meeting Times:	MWF 9:00a-9:50p
Room:	109 Pepper Canyon Hall (PCYNH)
Textbook:	<i>Vector Calculus</i> , 5 th Edition, Jerrold E. Marsden and Anthony J. Tromba
Optional Text(s):	<i>Div, Grad, Curl, and All That: An Informal Text on Vector Calculus</i> , by Harry Schey is an excellent intuitive introduction to the material. The Schaum's Outline Series <i>Vector Analysis, and an Introduction to Tensor Analysis</i> , by Murray R. Spiegel, is a classic "cookbook," and has scores of solved problems in Vector Analysis.
Prerequisites:	Math 20C or 21C
Course Webpage:	http://scicomp.ucsd.edu/~spav/class/2005W-M20E/
Final Exam:	Wednesday March 16, 8:00a-11:00a

Catalogue Description. *20E. Vector Calculus. (4) Change of variable in multiple integrals, Jacobian Line integrals, Green's theorem. Vector fields, gradient fields, divergence, curl. Spherical and cylindrical coordinates. Taylor series in several variables. Surface integrals, Stoke's theorem. Gauss' theorem and its applications. Conservative fields.*

Course Description. This course deals with *vector analysis*; we will examine methods for dealing with problems of "multidimensional flavor" that occur in engineering and sciences.

Grading Policy. Grading will be based upon performance in homeworks, two single hour exams, and a comprehensive final exam. The quarter grade is subdivided as follows:

Homework: 10%; Lesser score on midterms: 20%; Greater score: 25%; Final Exam: 45%.
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Note the scoring for the midterms: your better midterm score counts slightly more than your other midterm score. This is supposed to skew scores upwards, and decrease the effects of a "bad day." Final scores will be converted into letter grades as follows: a final score of at least 90% is an A- or better; a final score of at least 80% is an B- or better; a final score of at least 70% is an C- or better; a final score of at least 60% is an D or better.

These grade "promises" are guaranteed, but note that the "or better" might be *much* better, depending on certain factors: if the exams are too difficult, or the grading too harsh, etc. Thus, for example, the cutoff for a C- might be as low as 60%, say.

Frequently students are driven to ask for a change in grading policy late in the quarter. To make such a change would be unfair to any student who had already dropped the class thinking they couldn't pass. This is a calculus class, not a game show; there is no "deal-making." If you get a perfect score on the final exam, I will buy you a candy bar. The point of having midterm exams is to encourage students to review the material some time before 11pm the night before the final.

The dates and times for the midterms and final exam are listed in this syllabus: The first midterm is during class on Monday, January 31, the second is during class on Monday, February 28. The final is Monday, March 16 at 8am. If you have known conflicts with any of these exams,

I encourage you to switch to another section of 20E immediately. Legitimate, documented excuses for missing an exam will be dealt with individually.

Homework. There will be 9 homework assignments, each worth approximately one eighth of your homework grade. Your lowest homework score will be dropped. If you fail to hand in a homework, that homework is scored zero and may be dropped (depending on how many zero homework scores you have). Since the homeworks in this class get progressively harder, I encourage you to at least attempt all the homeworks in the first few weeks of class.

Homework is to be handed to the TA at the end of discussion section. *No late homework will be tolerated.* Do not irritate the grader by handing in dog-chewed, coffee-stained, unnamed, unstapled homework scribbled in illegible runes on diner napkins. The answers to many homework questions may be found in the back of the book, or in the solution manual. For this reason, unless a homework question is trivial (*i.e.*, no work is required), simply writing the answer to homework questions is not acceptable; you must *show all your work*. If you do not know whether a given homework question is trivial, you probably do not understand the question. You are doing yourself a disservice if you merely copy the answers from the back of the book, as failure to comprehend this review material will certainly be fatal to your 20E career.

It is expected, and encouraged, that students will work together on the homeworks. This saves time (yours, mine, and the TAs'), builds leadership, and encourages cooperation. Each student must submit their own homework, written in their own hand (please no printouts, photocopies or faxes). Since the exams are supposed to be similar to the homework, it is strongly suggested that students pay careful attention to the homework.

Getting Help. I encourage you to attend my office hours, and the office hours of your TA. Students can also get help at the Department's Calculus Lab, located in AP&M 2402, and open weekdays. See <http://www.math.ucsd.edu/frontdesk/roomschedule/apm2402/>

Help is also available from OASIS, which is a tutoring program requiring regular attendance. The OASIS sessions for this class will be held Mondays and Wednesdays from 12:00pm-1:50pm; See <http://oasis.ucsd.edu/mstp/mstp.shtml> for more information.

Calculators. You may not use a calculator of any kind during the exams.

Academic Integrity Students are expected to adhere to the University's Policy on Integrity of Scholarship, found in the UCSD general catalogue. Minimum punishment for cheating on a midterm exam is a score of zero on that exam.

Course Webpage. The course page, <http://scicomp.ucsd.edu/~spav/class/2005W-M20E/> will include this syllabus and any updates, general announcements, notices regarding the exams, etc.

Inspirational and Irrelevant Filler.

"A teacher is better than two books."

—German proverb

"This isn't rocket science, this is brain surgery!"

—The Simpsons

"Everything is deemed possible except that which is impossible in the nature of things."

—California Civil Code # 1597

Course Schedule. The lecture schedule is tentative, but the homework and exam schedules are exact.

week 1	M Jan 03	(Review) §1.1–1.3
	W Jan 05	(Review) §1.4–1.5
	Th Jan 06	Discuss HW1 with your TA.
	F Jan 07	§2.1, 2.4
week 2	M Jan 10	§2.3
	W Jan 12	§2.5
	Th Jan 13	§1.1 # 4, 5, 9, 14, 15
		HW 1 : §1.2 # 10, 15, 17
		§1.3 # 3, 10, 13, 25, 26
Th Jan 13	§1.4 # 1 (first 3 points from both (a) and (b)), 4, 8, 12, 13	
	HW 2 : §2.1 # 5, 8, 17	
	§2.4 # 1,3	
F Jan 14	§2.3 # 1(ab), 2(b), 6(ab)	
F Jan 14	§2.6	
week 3	M Jan 17	Martin Luther King, Jr. Holiday–No Meeting
	W Jan 19	§3.2
	Th Jan 20	§2.3 # 5, 13(ab), 16
		§2.4 # 5, 7, 9, 12
		HW 3 : §2.5 # 4, 5(b), 8, 13
Th Jan 20	§2.6 # 1, 2(b), 3(a), 4(ac), 6, 15	
	§3.2 # 2, 5	
F Jan 21	§4.2	
week 4	M Jan 24	§4.3
	W Jan 26	§4.4
	Th Jan 27	§4.2 # 1, 3, 8, 12
		HW 4 : §4.3 # 1, 3, 7, 8, 13, 20
		§4.4 # 1, 2, 10, 13, 14, 25, 30
F Jan 28	§5.1 & exam review	
week 5	M Jan 31	exam 1 covering §1.1–1.5, 2.1, 2.3–2.6, 3.1, 3.2, 4.2–4.4
	W Feb 02	§5.3, 5.4, 5.5
	Th Feb 03	§5.1 # 1(a), 2(a), 4
		§5.2 # 2(d), 4
		HW 5 : §5.3 # 2(b), 6
§5.4 # 1(a), 2(c), 8		
F Feb 04	§5.5 # 4, 11	
F Feb 04	§6.1	

week 6	M Feb 07	§6.2
	W Feb 09	§7.1
	Th Feb 10	<div style="border: 1px solid black; padding: 5px;"> §6.1 # 2, 3, 6 HW 6 : §6.2 # 1, 2, 5, 8, 11, 19, 29 §7.1 # 2(a), 4(a), 6(a) </div>
	F Feb 11	§7.2
week 7	M Feb 14	§7.3
	W Feb 16	§7.4
	Th Feb 17	<div style="border: 1px solid black; padding: 5px;"> §7.2 # 1(c), 2(a), 3, 11, 12, 14, 18 HW 7 : §7.3 # 2, 5, 12, 14 §7.4 # 1, 6, 7, 13 </div>
	F Feb 18	§7.5
week 8	M Feb 21	President's Day Holiday–No Meeting
	W Feb 23	§7.6
	Th Feb 24	<div style="border: 1px solid black; padding: 5px;"> HW 8 : §7.5 # 2, 4, 6, 7, 8, 10 §7.6 # 2, 3, 5, 7, 10, 18 </div>
	F Feb 25	§8.1 & exam review
week 9	M Feb 28	exam 2 covering §5.1–5.5, 6.1, 6.2, 7.1–7.6
	W Mar 02	§8.1, 8.2
	Th Mar 03	<div style="border: 1px solid black; padding: 5px;"> HW 9 : §8.1 # 1, 3(d), 4, 9, 12, 13, 15, 20 §8.2 # 1, 5, 6 </div>
	F Mar 04	8.2, 8.3
week 10	M Mar 07	§8.3, 8.4
	W Mar 09	§8.4
	Th Mar 10	<div style="border: 1px solid black; padding: 5px;"> final exam review questions (like a homework assignment, but not to be turned in) §8.2 # 10, 23 §8.3 # 4, 6, 7, 10, 12, 13(ab), 20 §8.4 # 2, 3, 5(a), 8 </div>
	F Mar 11	final exam review
finals	W Mar 16	Final Exam. 8:00a-11:00a