

Mathematics 53 - Multivariable Calculus Syllabus

Professor Tom Graber
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Office Hours: Tuesday 10-11, Wednesday 2-3, and Thursday 2-3

Head TA: Alice Medvedev (alice@math)

Text: J. Stewart, *Calculus (Early Transcendentals)*, 5th edition.

Class meetings: The main lectures are Tuesdays and Thursdays 3:40-5pm, in Room 155 of Dwinelle Hall. There are in addition 17 discussion sections:

Section	Teaching Assistant	Time (MWF)	Location
101	Smart	8-9 am	81 Evans
102	Clayton	8-9 am	9 Evans
103	Judson	11-12 am	51 Evans
104	Vito Cruz	9-10 am	200 Wheeler
105		9-10 am	6 Evans
106	Beal	10-11 am	7 Evans
107	Vito Cruz	10-11 am	4 Evans
108	Clayton	11-12 am	3102 Etcheverry
109	Beal	11-12 am	87 Evans
110	Rhea	12 - 1 pm	7 Evans
111	Dan-Cohen	12-1 pm	81 Evans
112	Dan-Cohen	1 - 2 pm	85 Evans
113	Rhea	1-2 pm	7 Evans
114	Judson	2 - 3 pm	6 Evans
115	Los	2-3 pm	425 Latimer
116	Los	3 - 4 pm	285 Cory
117	Smart	10-11 am	39 Evans

OVERVIEW OF COURSE

Topic	Number of lectures
Introduction, parametric equations	4
Vectors and Planes	4
Partial Derivatives	6
Multiple Integrals	6
Vector Calculus	8
Midterms, Review	3
Total classes	31

HOMEWORK AND QUIZZES

There will be a weekly quiz given each Wednesday in the discussion sections. There will be **no** make-up quizzes, but we will drop the two lowest quiz scores in computing your grade.

Homework from a main lecture on a Tuesday is due the next Friday in the discussion sections; homework from a main lecture on a Thursday is due on the next Monday in sections. The homework will be graded “pass/fail”.

TESTS

Exam	Date	Material covered
Midterm #1	March 9	Lectures 1-12
Midterm #2	April 22	Lectures 13-23
Final Exam	May 21, 12:30-3:30 pm	All lectures, with 24-31 emphasized

GRADES

Work	Percentage of final grade
Homework and Quizzes	20%
Midterm #1	20%
Midterm #2	20%
Final Exam	40%

If you do not take Midterm #1, Midterm #2 will count for 40% of your grade. If you take Midterm #1 but not Midterm #2, the Final Exam will count for 60% of your grade. If you take neither Midterm #1 nor Midterm #2, you will fail the course.

We will compute your grade as follows. You will earn a letter grade (with a plus or minus, if appropriate) for each item of work above, and we will later combine these grades as indicated to obtain the final grade for the course. The TAs will lastly identify borderline cases, for which we will carefully look at the numerical grades on the various tests to determine the grade.

Please save your midterms and quizzes, in case questions come up about the grading.

Grading. In the grading I put considerable emphasis on *getting the right answer* for the computational problems on the midterms and final exam. This means, typically, that about half the points will be given for setting up a problem properly and about half for computing the numerical answer correctly. In particular, you will lose many points for setting up the calculation incorrectly, even if the subsequent computations are correct.

I have this grading policy for two reasons:

(i) Firstly, I want to emphasize strongly the importance in mathematics tests of actually getting the correct answer. I feel very strongly that you must get the right answer to earn lots of credit, at least for easy problems. (For more difficult problems, I will give more partial credit for partial solutions.)

(ii) Secondly, in a large class it is extraordinarily difficult to assign partial credit to a student's calculations, after he/she has been made a mistake (even a simple error). There are an infinite number of erroneous pathways a calculation can take once there has been a mistake, and as a practical matter the graders do not have time to sort through all the subsequent computations and possible further errors.

	Date	Topic	Homework
1	Jan 20	Introduction, parametric curves	10.1: 1,5,7,11,14,15,21,31,33
2	Jan 22	Tangents, area	10.2: 1,3,5,7,13,15,17,27,29,73
3	Jan 27	Arc length, polar coordinates	10.2: 37,43,45,53,65 10.3: 17,19,21,23,27,41
4	Jan 29	More on polar coordinates and conic sections	10.3: 31,35,39,54,59 10.4: 3,5,17,29,37,45,47
5	Feb 3	Vectors	12.1: 3,15,17,21 12.2: 5,25,35 12.3: 23,26,59 12.4: 1,3,29,41
6	Feb 5	Lines, planes, and quadric surfaces	12.5: 3,5,21,39,53 12.6: 3,5,11,17,21-28,47
7	Feb 10	Cylindrical and spherical coordinates	12.6: 31,45 12.7: 11,15,19,39,49,51,63
8	Feb 12	Space curves	13.1: 3,5,19-24,25,34 13.2: 3,5,9,11,17,23,33,39
9	Feb 17	Functions of several variables	14.1: 21,23,24,30,37,39,41,45, 53-58 14.2: 1,3,5,11,13
10	Feb 19	Partial derivatives, tangent planes, differentials	14.3: 13,15,21,35,53,57,59 14.4: 1,3,5,11,13,31,33
11	Feb 24	Chain rules	14.5: 1,5,7,9,11,21,23,27, 29,31,47,49
12	Feb 26	The gradient	14.6: 5,7,9,11,13,15,21,25,39, 41,49,55
13	Mar 2	Maxima and minima	14.7: 1,3,5,7,11,27,29,31,41,53
14	Mar 4	Lagrange multipliers	14.8: 1,3,5,7,15,17,19,21,39
15	Mar 9	MIDTERM #1	covers Lectures 1-12
16	Mar 1	Double and iterated integrals	15.1: 1,5,11,13 15.2: 3,5,7,11,15,19,21,27,29
17	Mar 16	More on double integrals	15.3: 3,5,9,11,15,17,25,37,39 15.4: 1,3,5,6,7,9,11,19,23
18	Mar 18	Applications, surface area	15.5: 1,3,9,13,21 15.6: 1,5,7,9,11,21
19	Mar 30	Triple integrals	15.7: 3,5,7,9,11,15,17,19,33,37
20	April 1	Integrals in cylindrical, spherical coordinates	15.8: 1,3,5,7,9,13,17, 19,21,23,29,33,35
21	April 6	Change of variables, Jacobians	15.9: 1,3,5,7,9,11,13,15,17,19,21
22	April 8	Vector fields, line integrals	16.1: 5,11-18,21,23 16.2: 1,3,5,9,11,15,17,19,21,23
23	April 13	Fundamental Theorem for Line Integrals	16.3: 3,5,7,9,11,13,15,19,21,23
24	April 15	Green's Theorem	16.4: 1,3,7,9,13,15,19,21,27
25	April 20	Curl and divergence	16.5: 1,3,5,7,9,10,11,15,17,21, 25,27,31,33

	Date	Topic	Homework
26	April 22	MIDTERM #2	covers Lectures 13-23
27	April 27	Parametric surfaces	16.6: 1,3,11-16,17, 19,35,37,43,53(a)
28	April 29	Surface integrals	16.7: 5,7,9,11,13,17, 21,23,27,41,43
29	May 4	Stokes' Theorem	16.8: 1,3,5,7,9,13,15,17,19,20
30	May 6	Divergence Theorem	16.9: 1,3,5,7,9,13,21,23,25,28
31	May 11	Review	memorize chart on page 1134
	May 21	FINAL EXAM	covers all lectures