Mathematics 53 (Section 2)
Multivariable Calculus, Spring 2014

(revised February 2, 2014)

Professor Mariusz Wodzicki
995 Evans Hall

Office Hours: 2-3pm MWF

Text: J. Stewart, *Multivariable Calculus* (*Early Transcendentals*), 7th edition (paperback edition for UC Berkeley).

Class meetings: The lectures are Mondays, Wednesdays and Fridays, 11:10 am-Noon, in Room 2050 of Valley Life Sciences Building.

In addition, there are 15 discussion sections:

Section	Teaching Assistant	Time (MWF)	Location
201	Gavrus, C	5-6 pm	3102 Etcheverry
202	Ai, A L	8-9 am	45 Evans
203	Ai, A L	9-10 am	45 Evans
204	Ramsey, S N	9-10 am	55 Evans
205	Ramsey, S N	10-11 am	61 Evans
206	Theerakarn, T	10-11 am	30 Wheeler
207	Theerakarn, T	12-1 pm	55 Evans
208	Singh, J	12-1 pm	61 Evans
209	Singh, J	1-2 pm	55 Evans
210	Nguyen, A H	1-2 pm	39 Evans
211	Nguyen, A H	2-3 pm	39 Evans
212	Lim, D	2-3 pm	61 Evans
213	Lim, D	3-4 pm	39 Evans
214	Gavrus, C	4-5 pm	258 Dwinelle
215	Valby, L V	1-3 pm MW	230D Stephens

	Date	Topic	Homework
1	Jan 22	Introduction, parametric curves	**10.1:**5,9,11,15,24,28
2	Jan 24	Tangents, arc length	**10.2:**1,3,7,13,29,31,33,41
3	Jan 27	Polar coordinates	**10.3:**15,17,21,25,56,57 **10.4:**5,7
4	Jan 29	More on polar coordinates, conic sections	**10.4:**9,11,17,45,47 **10.5:**5,11,15,19 (sketch graphs only)
5	Jan 31	Vectors, lines and planes	**12.1:**13,15,31 **12.2:**17,21,23 **12.3:**1,7,23,37
6	Feb 3	More on vectors, lines and planes	**12.4:**1,5,9,13,27,33 **12.5:**3,7,11,19,25,27,31,61
7	Feb 5	Quadric surfaces	**12.6:**3,5,9,13,19,21-28,41,43
8	Feb 7	Space curves	**13.1:**9,21-26,27,35 **13.2:**9,11,13,15,19
9	Feb 10	More on space curves	**13.2:**45,47,49,50 **13.3:**1,3,5,11
10	Feb 12	Functions of several variables	**14.1:**23,27,29,30,32,55-60
11	Feb 14	Limits and continuity	**14.2:**1,5,9,13,19,29,33
12	Feb 19	Partial derivatives	**14.3:**15,17,19,21,23,35,39,41,45,47
13	Feb 21	Tangent planes, linear approximation	**14.4:**1,3,5,13,17,19,21,25,27,29
14	Feb 24	Chain rules	**14.5:**1,3,5,7,9,11,13,15,21,23
15	Feb 26	More on chain rules	**14.5:**25,27,29,31,33,45,58
16	Feb 28	The gradient	**14.6:**7,9,11,13,15,39,41,43,47,49
17	Mar 3	Maxima and minima	**14.7:**1,3,5,7,9,11,29,31,39
18	Mar 5	Lagrange multipliers	**14.8:**3,5,7,9,11,15,19,25,41
19	Mar 10	Double integrals	**15.1:**11,13 **15.2:**3,5,7,9,15,17,27,31
20	Mar 12	General regions	**15.3:**1,3,5,7,9,11,19,21,39,41
21	Mar 14	MIDTERM #1	covers Lectures 1-17
22	Mar 17	Polar coordinates	**15.4:**7,9,11,13,15,17,21,23,29
23	Mar 19	Applications, Surface area	**15.5:**1,3,5,7,11,15 **15.6:**3,5,7,9
24	Mar 21	Triple integrals	**15.7:**3,5,7,9,11,17,21,33
25	Mar 31	Cylindrical coordinates	**15.8:**5,6,7,17,19,21,23,27
26	Apr 2	Spherical coordinates	**15.9:**5,6,7,9,11,17,21,23,25
27	Apr 4	Change of variables, Jacobians	**15.10:**1,3,5,7,9,11,12,13
28	Apr 7	More on Jacobians	**15.10:**15,17(a),19,21,23,24
29	Apr 9	Vector fields	**16.1:**1,3,5,11-14,15-18,29-32
30	Apr 11	Line integrals	**16.2:**1,3,5,9,11,19,21,25,26,33

	Date	Topic	Homework
31	Apr 14	Fundamental Theorem for Line Integrals	**16.3:**3,5,7,9,13,15,17,23,27,28
32	Apr 16	Green's Theorem	**16.4:**1,3,5,7,8,9,11,13
33	Apr 18	More on Green's Theorem	**16.4:**17,19,21,22,23,24
34	Apr 15	Curl and divergence	**16.5:**1,3,5,7,9-11,13,15,21,25
35	Apr 21	Parametric surfaces, surface area	**16.6:**13-18,19,21,37,41,43
36	Apr 23	MIDTERM #2	covers Lectures 18-31
37	Apr 25	Surface integrals	**16.7:**5,7,9,11,13,15,17
38	Apr 28	Stokes' Theorem	**16.7:**19,21,23,27 **16.8:**1,3,5
39	Apr 1	More on Stokes' Theorem	**16.8:**7,9,11(a),13,15,19,20
40	Apr 30	Divergence Theorem	**16.9:**1,3,5,7,9,11,13
41	May 2	More on Divergence Theorem / Review	**16.9:**17,23,24,25,26,27
	May 13	FINAL EXAM (7-10 pm)	covers all lectures, but with emphasis on Lectures 32-41

Overview of the course

Topic	Number of lectures
Parametric Equations	4
Vectors and Planes	3
Vector Functions	2
Partial Derivatives	9
Multiple Integrals	9
Vector Calculus	12
Midterms	2
Total classes	41

Homework and Quizzes

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

Homework from a Monday lecture is due the next Friday in the discussion sections; homework from a Wednesday lecture is due the next Monday in sections; homework from a Friday lecture is due the next Wednesday in sections. The homework will be graded "pass/fail".

Tests

Exam	Date	Material covered
Midterm #1	Mar 12	Lectures 1-17
Midterm #2	Apr 23	Lectures 18-31
Final Exam	May 13	All lectures, with 32-41 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. You will not pass the course if you take neither Midterm #1 nor Midterm #2.

Your grade will be computed as follows. You will earn a letter grade (with a plus or minus, as 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 homeworks, midterms and quizzes, in case questions come up about the grading.

Grading policy. We put considerable emphasis on *getting the correct answer* in the grading of computational problems on the midterms and on the final exam. Approximately half the points will be given for setting up a problem properly and about half for computing the numerical answer correctly. You will loose many or even all points for setting up the calculation incorrectly, even if the subsequent computations or the answer are correct.

The grading policy thus emphasizes the importance in Mathematics tests of actually getting the correct answer. We feel very strongly that you must obtain the right answer to earn substantial credit, at least for the easier problems. (For more difficult problems, we may give partial credit for partial solutions.)

There is also a practical reason for this grading policy: in a large class it is extraordinarily difficult to assign partial credit to a student's calculations, *after* the student has 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.