

# Math 53M - Multivariable Calculus

Prof. L. Pachter  
1081 Evans Hall

**Office Hours** : 11:00am-12:00pm on Mondays, Wednesdays and Fridays, 1081 Evans.

**Head TA:** Alice Medvedev, [alice@math.berkeley.edu](mailto:alice@math.berkeley.edu) , Office Hours (first two weeks):  
W11-12, 1-4; Th1-4; F10-12, 3-5.

**Class meetings** : The main lectures are 10:00am-11:00am in 277 Cory. There are also 5 discussion sections:

Section	Teaching Assistant	Time (Tue & Th)	Location
101	G. Sargsyan	8:00–9:30 AM	B3A Evans
102	G. Sargsyan	9:30–11:00AM	B3A Evans
103	A. Medvedev	11:00–12:30 PM	B3A Evans
104	R. Mehta	12:30–2:00 PM	B3A Evans
105	R. Mehta	2:00–3:30 PM	B3A Evans

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

## Tests

Exam	Date	Material covered
Midterm # 1	March 1	Lectures 1-14
Midterm # 2	April 16	Lectures 15-32
Final Exam	May 17, 8–11 AM	All Lectures with 33-45 emphasized

## Grades

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

Grades will be computed in the following way: You will be assigned a letter grade (+ or –, if appropriate) for each item of work above and we will later combine these grades as indicated in the table to obtain the final grade for the course. Border-line cases will be identified by the TAs, and will have numerical grades further examined in order to determine the final grade.

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** . Consequently, please mark them in your calendars.

**Homework and Quizzes:** There will be a weekly quiz given each Tuesday in sections. There will be **no** make-up quizzes, but we will drop the two lowest quiz scores in computing your grade. Homework from main lecture on Monday is due on Thursday in sections; homework from the main lectures on Wednesday and Friday is due on Tuesdays in sections. The homework will be graded “pass/fail”.

	Date	Topic	Homework
1	Jan 21	Introduction	<b>10.1:</b> 1,3,11,15,17
2	Jan 23	Parametric curves	<b>10.1:</b> 21,22,28,31 <b>10.2:</b> 3,5,7
3	Jan 26	Tangents and Area	<b>10.2:</b> 11,13,21,29,31
4	Jan 28	Arc length and surface area	<b>10.3:</b> 1,3,5,9,15,21,24,25
5	Jan 30	More on polar coordinates	<b>10.4:</b> 39,42,48,49,55 <b>10.5:</b> 1,5,17,31,33,51,59
6	Feb 2	Vectors	<b>12.1:</b> 15,19,22, 21,25,26,40,44 <b>12.2:</b> <b>12.3:</b> 23,27,31,49,56,57
7	Feb 4	Lines and planes	<b>12.4:</b> 3,7,34,40,46 <b>12.5:</b> 1,5,17,18,35,56,65
8	Feb 6	Quadric surfaces	<b>12.6:</b> 3,9,14,19,21-28,45
9	Feb 9	Cylindrical and spherical coordinates	<b>12.7:</b> 37,38,45,53,56,57,68
10	Feb 11	Space curves	<b>13.1:</b> 5,9,13,19-24,42
11	Feb 13	Functions of several variables	<b>14.1:</b> 21,24,29,30,35,43,53-58, <b>14.2:</b> 1,3,18,27
12	Feb 18	Partial Derivatives	<b>14.3:</b> 11,13,29,33,51,55,66,72
13	Feb 20	Tangent planes and differentials	<b>14.4:</b> 1,5,9,11,19,31,41
14	Feb 23	Chain rule	<b>14.5:</b> 1,3,5,7,11,19,25,35,53
15	Feb 25	More on chain rule, implicit differentiation	<b>14.5:</b> 27,29,31,39,54
16	Feb 27	The gradient	<b>14.6:</b> 3,5,7,13,19,21-26,37,52
17	Mar 1	<b>Midterm #1</b>	covers Lectures 1-15
18	Mar 3	Maxima and minima	<b>14.7:</b> 1,3,5,8,10,29,31,33,41,53
19	Mar 5	Lagrange multipliers	<b>14.8:</b> 1,3,5,16,21,29,31,43
20	Mar 8	Double integrals	<b>15.1:</b> 1,5,11,17
21	Mar 10	Iterated integrals	<b>15.2:</b> 5,7,12,15,18,21,29
22	Mar 12	More on double integrals	<b>15.3:</b> 1,3,5,11,14,18,25,27,57
23	Mar 15	Applications	<b>15.4:</b> 1,3,5,6,7,8,9,11,13,21,36 <b>15.5:</b> 1,3,9
24	Mar 17	Surface area	<b>15.5:</b> 13,21 <b>15.6:</b> 1,2,4,7,10,21
25	Mar 19	Triple Integrals	<b>15.7:</b> 3,5,7,11,13,19,31,37
26	Mar 29	Integrals in cylindrical and spherical coordinates	<b>15.8:</b> 1,3,5,7,11,16,21,24,29
27	Mar 31	Change of variables, Jacobians	<b>15.8:</b> 29,33,38 <b>15.9:</b> 1,9,13,15
28	Apr 2	More on change of variables	<b>15.9:</b> 11,17,19,23
29	Apr 5	Vector fields	<b>16.1:</b> 5,11-14,15-18,21,22
30	Apr 7	Line integrals	<b>16.2:</b> 1,3,5,9,11,16,17,21,22,23
31	Apr 9	Fundamental Theorem of line integrals	<b>16.3:</b> 1,3,5,11,13,15,19,22,23
32	Apr 12	Green's Theorem	<b>16.4:</b> 1,3,7,11,15,17,19,21,25,29
33	Apr 14	Curl and divergence	<b>16.5:</b> 5,6,7,9-11,15,19,21,25,27
34	Apr 16	<b>Midterm # 2</b>	covers Lectures 15-31
35	Apr 19	More on curl and divergence	<b>16.5:</b> 29,30,33,36
36	Apr 21	Parametric surfaces	<b>16.6:</b> 1,3,5,11-16,17,19,23
37	Apr 23	Surface integrals	<b>16.7:</b> 5,7,11,13,19,21,23,28,41,42
38	Apr 26	Stokes's Theorem	<b>16.8:</b> 1,3,5,7,10,13
39	Apr 28	Applications	<b>16.8:</b> 14,17,19,20
40	Apr 30	Divergence Theorem	<b>16.9:</b> 1,3,5,7,10,11,15
41	May 3	Applications	<b>16.9:</b> 19,20,22,23,29
42	May 5	Review	
43	May 7	Review	
44	May 10	Review	