Multivariable Calculus (Fall 2018)

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Mathematics 53, Fall 2018
Multivariable Calculus

Instructor: Daniel Tataru
Office hours: Tuesday 13:00-15:30
Office location: 841 Evans Hall
email: tataru@math.berkeley.edu (mailto:tataru@math.berkeley.edu)

GSI office hours:

Chupin, Daniel. RR Week OH: Thursday, 2-3. Monday Dec. 10: 2-3 in 748 Evans		826 Evans
Rowan, James (https://math.berkeley.edu/~jrowan/53F18/)	Thursday & Friday 10-11	1056 Evans
Yeh, Michael	RRR week: Wed, Th, Fri 10-12	775 Evans
Shahan Mirzoyan	Thu. 1-2, Fri. 1-2 & 4-5	Evans 866
Stahl, Joe (https://calendar.google.com/calendar/b/1?cid=am9zZXBobWljaGFlbHN0YWhsQGJlcmtlbGV5LmVkdQ)	Finals week: Monday 1-5	1062 Evans
Nam, Kyeongsik	Monday 11-12 / 2-3 PM	1020 Evans
Zubkov, Maksym	Tue 5-6 PM & Th 5-6 PM	850 Evans
Zarkh, Anna (http://www.annazarkh.com)	Finals week: Monday 4-6pm	866 Evans
Pillai, Mohandas	Friday 1-3	1037 Evans

Room: Our class meets in Dwinelle 155 on Tuesdays and Thursdays from 8:10am until 9:30am. Participation in the class is strongly encouraged.

Text: J. Stewart, *Multivariable Calculus* (Math 53 at UC Berkeley), paperback, 8-th edition.

Topics: Parametric equations and polar coordinates. Vectors in 2- and 3-dimensional Euclidean spaces. Partial derivatives. Multiple integrals. Vector calculus. Theorems of Green, Gauss, and Stokes.

Homework: Homework from a main lecture on Tuesday is due the next Friday in the discussion sections; homework from a main lecture on Thursday is due the next Wednesday in sections. The homework will be graded “pass/fail”. No late homework can be accepted. Solutions for the homework problems will not be posted. If you have difficulties with homework problems, please use my office hours or the GSI's office hours to ask your questions.

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. There are no quizzes during the exam weeks and the Thanksgiving week.

Midterm 1: Thursday September 27 , in class, covers lectures 1-10

Midterm 2: Tuesday November 6, in class, covers lectures 12-21

Final exam: This is a three hour exam on 12/12, 3-6pm at a location TBA.

No books, notes, calculators, scratch paper or collaboration are permitted at any exam. Your student photo ID is required for the midterms and final exam.

Grading: The percentages are given by the next table:

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

We will compute your grade as follows. Each of the numerical scores for the items above will be separately curved, and you will receive a letter grade for each (with plus or minus, as appropriate). At the end we combine these letter 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.

Exam policy: There are no make-ups for the midterms or the final exam. 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.

Lecture	Date	Topic	Homework
1	Aug. 23	Parametric curves Tangents, arc length	**10.1:** 2, 8, 18, 28, 42 **10.2:** 4, 18, 30, 32, 34, 44, 48
2	Aug. 28	Polar coordinates Conic sections	**10.3:** 16, 24, 38, 54 **10.4:** 2, 6, 20, 40, 48 **10.5:** 6, 12, 16, 20 (sketch graphs only)
3	Aug. 30	Vectors, dot product Cross product	**12.1:** 10, 24; **12.2:** 14, 20, 24 **12.3:** 8, 16, 28, 44; **12.4:** 6, 14, 18, 22, 28
4	Sept. 4	Lines and planes Cylinders, quadric surfaces	**12.5:** 2, 10, 16, 20, 28, 40, 46 **12.6:** 4, 6, 10, 14, 36
5	Sept. 6	Vector functions	**13.1:** 12, 14, 22, 24, 26, 28 **13.2:** 12, 16, 26, 40, 42 **13.3:** 2, 4, 6; **13.4:** 10, 16
6	Sept. 11	Functions of several variables Continuity and differentiation	**14.1:** 22, 26, 28, 50, 66 **14.2:** 6, 18, 34 **14.3:** 20, 36, 42, 52, 80
7	Sept. 13	Tangent planes, linear approx. Chain rule	**14.4:** 2, 6, 14, 16, 18, 32 **14.5:** 4, 6, 8, 16, 22
8	Sept. 18	More chain rule The gradient	**14.5:** 34, 50 **14.6:** 10, 16, 24, 44, 50, 60
9	Sept. 20	Maxima and minima	**14.7:** 2, 12, 18, 22, 34, 38, 56, 60
10	Sept. 25	Lagrange multipliers	**14.8:** 4, 6, 8, 10, 20, 22, 30, 44
11	Sept. 27	MIDTERM 1	Covers Lectures 1-10
12	Oct. 2	Double integrals	

			15.1: 4, 10, 12, 20, 28, 42 **15.2:** 6, 10, 20, 26, 38, 58
13	Oct. 4	Double integrals in polar coords. Applications	**15.3:** 8, 10, 18, 26, 32, 34 **15.4:** 6, 16, 24
14	Oct. 9	Surface area Change of variables	**15.5:** 2, 4, 6, 8 **15.9:** 2, 6, 8, 10, 20, 28, 60(a)
15	Oct. 11	Triple integrals	**15.6:** 4, 8, 10, 14, 18, 20, 22, 26, 32, 54
16	Oct. 16	Cylindrical and spherical coord.	**15.7:** 10, 18, 20, 30 **15.8:** 10, 14, 24, 30, 48
17	Oct. 18	Change of variables Review	Review problems Chapter 15: 24, 30, 48, 56
18	Oct. 23	Vector fields Line integrals	**16.1:** 12, 14, 18, 24, 30, 32, 36 **16.2:** 10, 16, 18, 22, 36, 50
19	Oct. 25	Fundamental theorem for line integrals	**16.3:** 8, 14, 20, 26, 32, 34
20	Oct. 30	Green's theorem	**16.4:** 2, 8, 14, 22, 28, 30
21	Nov. 1	Curl and divergence	**16.5:** 6, 8, 12, 16, 20, 32, 34
22	Nov. 6	MIDTERM 2	Covers Lectures 11-21
23	Nov. 8	Parametric surfaces	**16.6:** 2, 6, 14, 16, 18, 24, 36, 42, 48, 52
24	Nov. 13	Surface integrals	**16.7:** 4, 6, 8, 12, 22, 24, 30, 40, 42
25	Nov. 15	Stokes Theorem	**16.8:** 2, 6, 10, 14, 16, 18, 20
26	Nov 20	More Stokes	
27	Nov. 27	The Divergence Theorem	**16.9:** 2, 6, 10, 14, 18, 20, 24, 26, 30
28	Nov. 29	Introduction to PDE's	

Course Summary:

Date	Details	
Wed Aug 29, 2018	Quiz 1 (https://bcourses.berkeley.edu/courses/1473709/assignments/7923571)	due by 11:59pm
Wed Sep 5, 2018	Quiz 2 (https://bcourses.berkeley.edu/courses/1473709/assignments/7923572)	due by 11:59pm
Wed Sep 12, 2018	Quiz 3 (https://bcourses.berkeley.edu/courses/1473709/assignments/7923524)	due by 11:59pm
Wed Sep 19, 2018	Quiz 4 (https://bcourses.berkeley.edu/courses/1473709/assignments/7923573)	due by 11:59pm
Thu Sep 27, 2018	Midterm 1 (https://bcourses.berkeley.edu/courses/1473709/assignments/7927788)	due by 11:59pm
Wed Oct 3, 2018	Quiz 5 (https://bcourses.berkeley.edu/courses/1473709/assignments/7929745)	due by 11:59pm
Tue Nov 6, 2018	Midterm 2 (https://bcourses.berkeley.edu/courses/1473709/assignments/7937092)	due by 11:59pm
	Final (https://bcourses.berkeley.edu/courses/1473709/assignments/7941125)	
	Final grade (https://bcourses.berkeley.edu/courses/1473709/assignments/7943511)	
	Section grade (https://bcourses.berkeley.edu/courses/1473709/assignments/7941117)	