

# MATH 318: Introduction to Calculus of Several Variables

Spring 2020

## Course Syllabus

- **Instructor:** Aliakbar Daemi <[adaemi@wustl.edu](mailto:adaemi@wustl.edu)>
- **Office:** Cupples I, Room 207A St
- **Course Assistant:** Jason Oberstein <[joberstein@wustl.edu](mailto:joberstein@wustl.edu)>
- **Class Schedule:** MWF 3:00-3:50 pm, Cupples I, Room 207.
- **Office Hours:** Tuesday 9:00 pm-10:00 pm, Thursday 2:00-3:00 pm.
  
- **About the Course:** In this course, we will see an introduction to differential and integral calculus of functions of  $n$ -variables making some use of matrix algebra. The topics which we will cover include basic language of point-set topology, derivatives of vector valued functions of vector variables, chain rule, Inverse and Implicit Function Theorems, analyzing quadratic forms, manifolds and integration over manifolds.  
The course is at a level of rigor intermediate between that of Calculus III and upper level analysis courses. The Prerequisites for this class are Math 233 and 309.
  
- **Where to Find Course Materials:** I will maintain a website for the course: <https://www.math.wustl.edu/~adaemi/Calc-sev.html>. You may find there the plan for each lecture and the worksheets (see below). I also use Canvas to send announcements, keep track of your grades and post a copy of the textbook. So make sure that you get immediate notification after announcements are posted on Canvas.
  
- **Textbook:** *Calculus of Several Variables*, by Brian E. Blank. This book is available as a free pdf and is posted on Canvas; you can print it out as desired. In return for this free textbook, please respect the author's requests on page 4; in particular, **posting the book online is not allowed**. Each lecture of the class is based on one or more sections of the textbook. I strongly recommend reading the relevant part of the textbook after (or even better before) each lecture.
  
- **Worksheets:** After discussing the theoretical part of each lecture, I go over a few problems based on the new concepts. I put together these problems in a worksheet and post them to the course website. Sometimes I might first ask you to work on a problem in the worksheet either individually or in a group.
  
- **Homework:** For most weeks of the semester, there is a homework assignment. The problems will be posted online in **Corwdmark**, and you should upload your solutions there. The problem set of each week is due on **Friday** of that week at **6:00 pm**. If you miss the deadline, you can submit your assignment until **Sunday** of the week at **6:00 pm**, and you will be penalized 30% of your grade. Our CA grade your assignments and return the grades in Crowdmark. Depending on the length of the problem set, the CA might only grade a random set of problems which is chosen after you turn in your homework and is the same for everyone.

Homework problems form an essential part of this class. For one thing, they constitute a good portion of your final grades. More importantly, spending enough time on homework problems helps you to have a better grasp on the materials of the class. You should start working on homework problems closer to the time that they are assigned, not when they are due. You can, and in fact are encouraged, to collaborate on solving homework problems. Your classmates provide you with one of the best learning resources. So take advantage of that as much as possible. That being said, you should make sure that you know how to solve each problem after discussing it with others and then write it in your own language. Wring math is another important skill that you develop by doing homework problems.

- **Exams:** There will be one in class Midterm, two take-home Midterms, and a **Final Exam**. The dates and times are listed below; the location for the final will be announced later. Make sure that you are available at the listed times for the exams. Success on the exams will require correct and efficient solutions to the more difficult homework problems. Calculators are not allowed in the exams. On the other hand, there will not be computationally heavy problems in the exams.

Midterm I: Wednesday, February 12, 3:00-3:50 pm, Cupples I, Room 207.

Take Home Midterm I: Sunday, February 16 - Saturday, February 22.

Take Home Midterm II: Sunday, April 5 - Saturday, April 11.

Final Exam: Friday, May 1, 8:30-10:30 pm.

- **Letter Grade:** Your final letter grade will be computed based on the following wighted combination of your exams and homework grades. The cutoff grades which will be used to convert your weighted grade into a letter grade will be announced at the end of the semester.

Midterm 1	Take-home Midterm 1	Take-home Midterm 2	Final	Homework
15%	5%	20%	35%	25%

- **Tentative Schedule for the Course:**

Week	dates	Sections	Assignments due	Notes
1	1/13-1/17	1.1-1.4		
2	1/22-1/24	1.4-1.6	Problem Set 1	Martin Luther King Day Add/drop deadline (1/23)
3	1/27-1/31	1.6-2.1	Problem Set 2	
4	2/3-2/7	2.2-2.5, 2.6	Problem Set 3	
5	2/10-2/14	2.7, 3.1	Problem Set 4	Midterm 1
6	2/17-2/21	3.1, 3.2, 3.3	Take-home Exam I	
7	2/24-2/28	3.3, 3.5, 3.6	Problem Set 5	Deadline to change to pass/fail (2/28)
8	3/2-3/6	3.7	Problem Set 6	week before Spring Break
10	3/23-3/27	4.1-4.2	Problem Set 7	
11	3/30-4/3	4.3-5.1	Problem Set 8	Withdraw deadline (4/3)
12	4/6-4/10	5.2-5.3	Take-home Exam II	
13	4/13-4/17	5.3-6.1	Problem Set 9	
14	4/20-4/24	6.1-6.2	Problem Set 10	

Check the course website regularly during the semester to see the updated schedule.

- **Disability Services:** If you require accommodations for a disability which affect your work during the exams or the class, please contact the Office of [Disability Resources \(DR\)](#) promptly to discuss appropriate

arrangements. Send your VISA (which you will receive from DR) to me at least two weeks in advance of the first exam so your accommodations can be arranged.

- **Campus Resources:**
  - [The Bulletin](#) - university academic policies
  - [Mental Health Services](#)
  - [The Learning Center](#) - academic support services
  - [Title IX](#) - resources on sexual harassment and discrimination
  - [Disability Resources](#) - exam and other accommodations
  
- **External Math Resources:**
  - [Wolfram Alpha](#) is a great way to check your work. Do not use it, however, to do homework problems for you.
  - [Sage](#) is a Python-based system intended as an open-source alternative to Wolfram Alpha, Mathematica, and similar systems.
  - [GNU Octave](#) is an open-source alternative to Matlab.
  - [Khan Academy](#) has been immensely popular with many of my students as a supplemental resource.

**Enjoy the Course!**